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The Research Quarterly

of the

American Physical Education Association

VOL. V MAY, 1934 No. 2

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A Short Battery of Tests to Measure Playing Ability in Women's Basketball†

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INTRODUCTION

SCIENTIFIC measurement of the results of teaching has an established place in the field of education today. However, reliable and valid tests of ability and achievement in physical education activities are as yet comparatively few. A battery of tests for any game, if it were a valid index of playing ability, might be useful in several ways. It might be used in classifying players, in determining progress in skill, in providing an incentive to practice, and in judging a teacher's efficiency. While there is no single battery of tests which measures all the skills of basketball for women, various achievement tests have been devised in both the men's and the women's game.

PREVIOUS EXPERIMENTATION IN BASKETBALL SKILL TESTS

The earliest published tests of skill in certain elements of the game of basketball were included in batteries of tests devised to measure "all-round ability." Examples of this type of test may be found in the Athletic Badge Tests,*[14] the California Decathlon,[8] the basketball tests in the Motor Ability Tests of the American Physical Education Association,[2] the Bliss study of progression of skills in boys and girls of junior high school age,[4] and Reilly's plan of rational athletics.[15]

The first attempt to measure scientifically all of the fundamental skills of the game of basketball was made by Brace[7] in 1924. Six tests were devised and scored according to a T-scale scoring plan. Some of these tests were given to a group of women but no mention is made of a modification of the tests for this purpose.

† This study presents, in condensed form, the content of two theses, submitted by the authors in partial satisfaction of the requirements for the degree of Master of Arts in Physical Education in the Graduate Division of the University of California, Berkeley, California. The study was directed by Anna Espenschade, Assistant Supervisor of Physical Education for Women, and Pauline Hodgson, Assistant Professor of Physical Education for Women. Intensive descriptions of the tests are included in the appendix as many requests to borrow copies of them have been received.

* Figures refer to bibliography at end of article.

In 1929 Bliss published the book, *Basketball*,[5] and included in it scoring tables for seven proficiency tests in the skills of basketball for boys and men from junior high school to college. In 1932, Edgren[9] published an account of an experiment in the testing of ability and progress in basketball for men. He concluded that ability and progress in the game could be satisfactorily measured.

It may be noted that most of the experimentation cited is with skills in the men's game. Certain of these tests should not be used for women, since the women's game has been modified in specific ways. The division of the court into two or three sections and the restriction to one bounce are examples of the adaptation of the game to women players. Recently published books on basketball[10, 11] and athletic games for women[3, 13] list various suggestions for achievement tests in basketball but there is no record of experimentation or careful selection of tests, and no standards have been established.

EXPERIMENTAL PROCEDURE

In the present study, the game of women's basketball was analyzed into its constituent skill elements. Then, all existing tests were assembled from the literature in the field, and classified. A large number of original tests also were devised to measure certain skills. After a critical analysis of all of the tests, seventeen were selected for experimentation. On the basis of the results obtained, twelve tests were retained for further study. The validity of each of these twelve was then determined. On the basis of validity, reliability, objectivity, and practicality, five tests were finally selected for a battery. The validity of this battery of tests was then determined.

Basketball Analyzed into Skill Elements.—Basketball is a complex activity involving the "total response" of the individual. A good player must possess certain emotional, organic, and neuro-muscular qualities. In order to measure completely an individual's ability to play the game, all these qualities would have to be tested. However, this study is concerned only with testing the neuro-muscular or physical skill factor. It must be recognized also that accuracy in measuring this skill factor is influenced by certain environmental factors such as, heat or cold, wind, surface of the court, degree of inflation or newness of the ball.

The essential elements of the game may be summarized as follows: ***First,*** throwing and catching the ball. This includes accuracy in throwing, speed in throwing, timing in throwing, and catching the ball in relation to throwing. *Second*, handling the body in relation to the ball. This refers to ability to move quickly, to change direction (which includes the turn or "pivot") and to jump. ***Third,*** throwing for basket. This includes throwing goals from the free-throw line and throwing goals from the area around the basket, i.e., the "field."

Classification and Preliminary Selection of Tests.—Thirty-six tests‡

‡ A list of these tests is included in the Appendix.

were assembled from various sources and classified under skill elements, according to the above analysis. These tests were experimented with, carefully analyzed, and then subjectively evaluated. Seventeen tests were selected on the basis of their comparatively greater validity, reliability, objectivity, and practicality. This subjective evaluation was next objectively checked by giving the tests to groups of basketball players. The tests were given to 160 freshmen and sophomore women students enrolled in elementary basketball classes in the Department of Physical Education for Women at the University of California. In addition, 4 of the tests (Interception, Moving Quickly, Wall Target, and Bounce and Shoot) were given to approximately 36 experienced players participating in the Women's Athletic Association basketball program, and 1 test (Free Jump) was given to 30 students in a class in stunts and tumbling. Two tests (Alden 40-Yard Run and Dodge Test) were given to 34 senior students in a games course for physical education majors.

Reliability of Tests Established.—In securing data to establish the reliability of the tests, the situation and the procedure were controlled to eliminate errors in so far as it was possible. The tests were given twice to the same group, a week apart. They were given in the same situation, at the same time of day and in the same order. Each test was definitely described and standard directions were in the hands of the examiner. The examiner who gave the test the first time did so the second, to eliminate errors in tests which were not perfectly objective.

The coefficients of reliability of these tests are given in Table I.

TABLE I
RELIABILITY COEFFICIENTS

Test	r_{12}	P.E. r	P.E. Meas.	Players Tested
1. Free Jump	0.98	±.004	0.35	60
2. Alden Forty-Yard Run	0.85	±.006		33
3. Speed Pass (wall)	0.78	±.042	2.50	40
4. Dodge Test	0.71	±.01		33
5. Bounce and Shoot	0.67	±.029	1.04	58
6. Reach and Jump	0.67	±.053	0.77	51
7. Interception	0.67	±.083	2.59	65
8. Pivot Bounce	0.57	±.105	11.22	19
9. Speed Pass (2 persons)	0.55	±.067	3.38	50
10. Wall Target	0.49	±.078	1.22	52
11. Moving Target	0.47	±.061	1.06	35
12. Bounce	0.47	±.095	8.42	31
13. Moving Quickly	0.41	±.102	2.34	67
14. Field Goals (Index Numbers)	0.41	±.091	0.04	38
Field Goals (Goals only)	0.37	±.095	0.71	40
15. Free Throw	0.32	±.072	0.83	64
16. Juggle	0.24	±.044	7.74	38
17. Edgren Ball Handling Test§				

§ The reliability of this test was not checked, but from previous experimentation it was assumed to be satisfactory for this study.

On the whole, the coefficients of reliability of the tests, as computed from correlating the scores of the tests given twice, were fairly low. However, Garrett[12] states that generally speaking, an r of $\pm.40$ to $\pm.70$ is substantial. The retention of tests having an r of approximately .50 was also suggested by Cozens.|| The tests which were eliminated because of low reliability were the juggle, field goals, pivot bounce, moving quickly, and the bounce. The free-throw test had a coefficient of reliability of 0.32 but was retained for further consideration as it was the only test for that particular skill. Since 5 tests were eliminated as unsatisfactory, 12 tests remained for further experimentation. The validity of each of these tests was next determined.

Validity of Individual Tests Determined.—To determine the validity of the individual tests, each test was correlated with a criterion of playing ability. Certain experts¶ in the field had agreed that this group of tests measured all of the fundamental skills, and, therefore, the sum of the test scores might be considered an index of all-round playing ability. Since this total score criterion of playing ability was an objective criterion, and was more economical of time than other criteria which might have been used, it was chosen for this study.

The twelve tests were given to thirty-four members of a games course for senior students majoring in physical education at the University of California. This group was chosen because it was easily available for testing. The class was studying the theory and practice of basketball, and it was possible to use class time for the testing program. Although this was a selected group, there was a wide spread of playing ability in basketball. The instructors' rating of the players' abilities showed a normal distribution.

Manner of Selecting Tests for the Short Battery.—Tests were finally selected for a short battery primarily through statistical analysis. The validity of the tests (i.e., the degree of correlation with the criterion score) was the most important factor influencing the individuals making the selection.

Since the test scores were measured in a number of units, as seconds, points, and number of trials, it was necessary to convert all of them to a common basis in order to compare them. This was done by computing T-scores from the raw scores.[6] Next the T-scores of each test were correlated with those of every other test. In four cases, there were two tests which correlated fairly highly with each other, which indicated that both probably measured the same skill element to some extent. In these cases the tests were averaged so that no one skill element would have a greater value in the total score than another. The tests which were averaged were:

|| Private communication from Cozens to Moser in 1932.
¶ Anna Espenschade, Pauline Hodgson, Helen Moser.

Tests	*Skill Tested*	*Coef. of Correlation*
Bounce and Shoot Free Throw	Throwing for goal	.576
Speed Pass (wall) Speed Pass (between 2 persons)	Speed in throwing and catching	.686
Free Jump Reach and Jump	Jumping	.517
Alden Forty-Yard Run Dodge Test	Moving quickly	.690

When the composite total scores were computed, the scores of each test were correlated with them to determine the validity of each test. After selection of tests of high validity, a consideration of objectivity, economy of time, and intricacy of set-up further influenced the choice of tests for the short battery.

DISCUSSION OF TEST RESULTS AND SELECTION OF TESTS FOR THE BATTERY

The tests which have a coefficient of correlation with the total score of approximately .50 or greater are listed in order of their degree of validity:

*Edgren Ball Handling Test	.773
*Wall Speed Pass	.715
*Free Jump	.668
Speed Pass (2 persons)	.619
*Bounce and Shoot	.610
*Moving Target	.587
Dodge Test	.555
Free Throw	.537
Reach and Jump	.497
Interception	.493

* Tests selected for the battery.

Since the validity of the individual tests would influence the validity of the battery as a whole, the tests listed first were given first consideration in selecting tests for the battery. The second consideration was that the tests selected should include measures for all of the essential skills of women's basketball as defined by Moser. The five tests which were selected because of their relatively higher validity were also more objective, more economical of time, and easier to set up than the other tests which were considered for the different skill elements.

Tests Selected for the Final Battery.—

Test	*Skill Tested*
1. Wall Speed Pass	Speed in throwing and catching
2. Moving Target	Timing in throwing; accuracy
3. Bounce and Shoot	Accuracy in goal throwing
4. Free Jump	Jumping
5. Edgren Ball Handling Test	Moving quickly; changing direction; accuracy in throwing; speed in throwing and catching

Procedure in Validating the Battery of Five Tests.—The criterion of expert opinion was chosen to validate the selected battery. Three judges independently rated the ability of each player in a game. Among the judges** who rated the players were nationally rated "A" basketball referees, instructors, and coaches in the Department of Physical Education for Women at the University of California. The reliability of the judges' ratings was checked by counting the number of cases in which two or three of the judges gave the same rating to a player. In seventy cases out of ninety-three players rated, all three judges agreed on the ratings. In twenty-one other cases two judges agreed on the ratings. This gave a total of ninety-one cases out of a possible ninety-three, in which there was agreement of either two or three judges. This check shows that the judges agreed closely with each other in their ratings, and indicates that the criterion of expert opinion is reliable in this study.

In order to eliminate any error due to the growth factor, only girls of approximately equal age (college age, eighteen to twenty-three years) were used for the study. In considering the various basketball groups and teams which might be available for rating and testing, five levels of playing ability were defined. From observations made during the previous year, the judges were familiar with the type of competition and the playing ability of the groups which were classified on the five levels. The highest level was typified by some of the members of a team which had won the "A" division championship of the Pacific Athletic Association Basketball League for a number of years. The second level of playing ability was represented by the advanced players in the Women's Athletic Association of the University of California. (Basketball in the Women's Athletic Association is divided into advanced and intermediate groups.) On the third level of playing ability were the intermediate players of the Women's Athletic Association. The fourth level included players in two physical education classes in elementary basketball at the University of California. In the fifth, and lowest level, were the players of the elementary basketball classes who showed little or no skill. Other groups of players might have been classified on these same levels, but the groups named gave sufficient numbers for the validation of the battery, and therefore were rated and given the tests.

In rating, the judges selected the individuals whose playing ability was on a level above or below the level on which their group was classified. The ratings and the scores of the tests were correlated to obtain an index of the battery's validity.§§ Only those tests scores were used which had ratings upon which either two or three judges had agreed.

The battery of tests was also given to a number of teams and players who were not rated. These scores were used in correlating individual test scores with the total scores and in intercorrelating the tests. Since the

** Names of judges are included in the Appendix.

§§ See Table III.

validity of each test in the battery had already been checked by a similar correlation with a total score, and intercorrelations had been obtained, this was done simply as a check on the first results.

Results and Discussion of the Validity of the Battery.—The following groups of players were rated and tested:

	Number of players	*Classification*	*Number of players on level on which group was classified*
San Francisco Emporium Team	6	1st level	2
Advanced W.A.A. Players at U.C.	13	2nd level	8
Intermediate W.A.A. Players at U.C.	22	3rd level	14
2 Elementary Basketball Classes at U.C.	50	4th and 5th levels	29 and 12

The coefficients of correlation were computed by Pearson's product-moment method. The coefficient of correlation of the total test scores with the ratings on which 3 judges agreed is .859. When the ratings on which either 2 or 3 judges agreed are used, the coefficient of correlation is .855. The difference in the 2 coefficients of correlation is probably due to the

TABLE II
INTEREST CORRELATIONS AND VALIDITY COEFFICIENTS

	Bounce and Shoot	Speed Pass	Free Jump	Edgren Test	Moving Target	Total Score
Bounce and Shoot	—					
Speed Pass	.368	—				
Free Jump	.218	.417	—			
Edgren Ball Handling Test	.253	.338	.199	—		
Moving Target	.419	.352	.349	.309	—	
Total Score	.691	.791	.668	.677	.720	—
2 and 3 Ratings*	.516	.605	.556	.630	.580	.855
3 Ratings only						.859

* Ratings on which either 2 or 3 judges had agreed.

slight difference in the reliability of the ratings. The ratings on which the 3 judges agreed have a higher reliability. The results of these correlations show that the battery of tests has a high degree of validity, that is, it is a fairly accurate measure of playing ability. The individual tests all correlate highly with the total score. The coefficients of correlation range from .668 to .791. The coefficients of correlation between tests are low, ranging from .218 to .419. This indicates that no 2 tests measure the same skill element and that all are adding something to the validity of the total score.

Further Consideration of Test Scores.—In addition to ratings and test scores, the playing position which the players preferred, was recorded. This was done for the purpose of calculating the average scores

in the various tests, for the different positions. Should the players of any one position make higher scores on a test than the players of other positions it might indicate that the test measured a specific rather than a fundamental skill.

The results of this computation showed that the forwards made slightly higher scores in the bounce and shoot test;|| || the side centers, who were frequently the shorter girls, made slightly lower scores in the free jump test which depends upon height to a great extent. However, these

TABLE III
AVERAGES OF T-SCORES BY POSITIONS AND RATINGS

Position	Rating	Bounce and Shoot	Speed Pass	Free Jump	Edgren Test	Moving Target	No. of Cases
Side Centers	2	56.5	64.5	52.3	58.3	62.2	4
	3	51.4	48.2	45.9	47.5	42.7	4
	4	44.4	45.8	46.5	42.1	46.6	8
	5	48.2	35.9	39.0	36.6	41.3	5
	all	50.1	48.6	45.9	46.1	48.2	21
Tap Centers	2	47.4	51.6	75.9	58.2	51.4	1
	3	44.7	49.5	55.1	52.5	50.2	3
	4	44.5	33.5	49.4	47.4	44.7	4
	5	45.4	31.3	40.2	42.9	39.8	2
	all	45.5	41.5	55.2	50.0	46.5	10
Guards	1	61.5	64.9	63.2	54.8	55.9	2
	2	50.6	57.2	53.7	56.9	56.1	5
	3	47.8	48.1	53.0	51.0	54.2	10
	4	47.4	42.6	46.8	40.2	45.1	8
	5	45.4	37.7	42.5	31.9	37.9	2
	all	50.5	50.1	51.8	47.0	49.8	27
Forwards	1	63.5	68.0	65.5	63.8	61.2	2
	2	68.2	60.3	54.7	59.2	63.1	6
	3	56.0	52.6	54.5	58.7	53.2	11
	4	47.4	47.2	48.8	48.5	47.6	12
	5	46.0	35.1	44.3	43.2	37.9	3
	all	56.2	52.6	53.6	54.7	52.6	34

differences were not large, and the writer concluded that the tests measured fundamental skills. In a few cases the averages included only two or three cases, and therefore cannot be depended on too highly. More test scores are necessary to make these averages statistically reliable.

SUMMARY AND CONCLUSIONS

The purpose of the research reported in this study was to construct a short battery of tests to measure playing ability in women's basketball. It was assumed that the interest and attitude factors influencing playing ability were the same for all those who were tested, since these players

|| || See Table III.

had elected basketball voluntarily. For this reason the study was limited to the consideration of physical skill factors influencing playing ability.

The method of constructing the battery of tests was as follows:

1. The game of women's basketball was analyzed into its constituent skill elements.

2. Eighteen tests, assembled from the literature in the field, and in addition, eighteen original tests were critically analyzed. From these, seventeen tests were selected on the basis of their comparative reliability, objectivity, and practicality.

3. The reliability,¶¶ objectivity, and practicality of the seventeen tests were then objectively established by giving the tests twice to a selected group. The coefficient of reliability for each was computed, and a detailed statistical study of each was made. The result was that twelve tests were recommended for use in constructing a battery.

4. The validity of each of the twelve tests was then determined. This was done by computing T-scores and correlating individual test scores with weighted total scores by Pearson's product-moment method.

5. Upon the basis of validity, objectivity, practicality, and reliability, five tests were selected for a battery.

6. The validity of this battery (i.e., the degree to which the battery actually measures playing ability) was established by correlating the total scores of the tests with the rating by expert judges of the player's ability in a game situation. This criterion is a reliable one since, in 70 cases out of 93, 3 judges agreed upon the player's rating. In 91 cases out of 93 there was agreement of either 2 or 3 judges. The coefficient of correlation between the total test scores and the judges' ratings is .859, a high degree of validity. This degree of validity indicates that an individual's playing ability can be measured fairly accurately.

7. Each of the five tests in the battery has a high correlation with the total score and a low correlation with each other. This shows that no two tests measure exactly the same element, and that each test is adding something to the validity of the total score.

Suggestions for Further Research.—Norms of playing ability for girls of college age may be set up by obtaining a large number of test scores from players in all sections of the country.

Further research in basketball testing may permit substitution in some cases of simpler and equally valid and reliable tests in the battery itself.

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APPENDIX

A. COMPLETE LIST OF TESTS CONSIDERED IN THIS STUDY

The tests comprising this list came from books and articles on basketball for both men and women, and, in addition, tests devised by Miss Espenschade, Miss Hodgson, and Miss Moser. There were eighteen tests which came from printed sources, and eighteen which were especially devised or which had been used in the Physical Education Department of the University of California previously. A brief outline of the thirty-six tests listed, follows: (* indicates that the tests were used but modified; ** indicates the tests used in the study and described later.)

THROWING AND CATCHING

A. *For Speed*

1. Push pass against a brick or other solid wall. Subject stands 8 feet from the wall. Ten tries. Time is taken from the instant the first throw strikes the wall until the tenth throw strikes.

*2. As in 1 above, except the line is 6 feet from the wall, and the number of throws in 30 seconds is scored.

3. As in 2 above, except the number of times the ball strikes the wall in 20 seconds is taken.

**4. Speed pass using 2 persons.

B. *For Accuracy*

5. Subject stands behind a line 30 feet from a target drawn on a wall. The target is a double rectangle, the outer being 4 x 5 feet and the inner 12 inches less each way. The lower edge is 14 inches from the floor. The single overhand throw

is used. Five tries are given, and the score is points awarded for hitting certain areas of the target. Maximum score is 10.

6. Push pass as above except subject stands 25 feet from the target.

7. Ten throws at a circle 4 feet in diameter. The center of the circle is 5 feet from the floor. Line ball counts as hit.

**8. Pass for accuracy, target on wall.

9. Target 12 inches square. Lower edge 36 inches from the floor. The subject stands behind a line 10 feet from the target. The pass is designated by the instructor. Ten tries are given and 1 point is awarded each time the target is hit.

10. Target 12 inches square. Lower edge 48 inches from the floor. The subject stands behind a line 15 feet from the target. Five tries, each using (1) chest pass, (2) one-hand underhand, (3) two-hand overhead or one-hand overarm.

**11. Pass for accuracy, moving target.

C. *Catching on the Run*

12. The thrower stands under the basket on the end line of the court. The receiver runs 15 feet:

a) head-on run to receive the ball at the free-throw line.

b) diagonal run past an Indian club placed at the junction of the free-throw lane with the circle, left and right sides.

D. *The Bounce*

13. Two parallel lines are drawn on the floor 6 feet apart. The subject starts behind 1 line, bounces the ball across the space between the lines, and recovers the ball across the second line. It is a failure if the ball is not recovered or if the ball is recovered before both feet have crossed the second line. Ten tries.

14. As above, except that the player reverse-pivots after recovering the ball across the second line and passes it. The time it takes to pass the ball after pivoting is taken. The best time out of 5 tries is recorded.

*15. Two parallel lines 6 feet apart are drawn on the floor. Beyond the finish line is another so that the first and third lines are 8 feet apart. The subject starts behind line 1 and bounces across the space. She scores 1 point if the forward foot reaches the 6-foot line, 2 points if she is within the zone between the 6-foot and 8-foot lines, and 3 points if she crosses the 8-foot line with one or both feet. Five tries.

16. As in 14, except that the pass must be made to hit a target on the wall. The target is 2 feet square, the lower edge of which is 36 inches from the floor.

E. *The Juggle*

**17. Juggle for distance.

HANDLING THE BODY IN RELATION TO THE BALL

A. *Stopping Quickly*

18. A straightaway run between 2 division lines of the court and a required stop before a third line is crossed is made. Time of the run is taken. The run must be at full speed.

B. *Stopping Quickly and Changing Direction*

19. The subject runs and dodges in and out between stools placed so as to form lanes in a zigzag formation. Time is taken from the start until she crosses the finish line.

20. The subject runs through a zigzag lane with 2 turns drawn on the floor between the lines marking off the center section of the court. To the first turn the lane is 8 feet, and the remainder finishes at the third division line. The runner starts at the first line, runs to the first turn, and stops, goes to the second turn and stops, then sprints to the finish. Time is taken from the start to the finish. (A "stop" is defined as a momentary pause with both feet in contact with the floor.)

**21. Speed of Movement and Changing Directions.

**22. Alden Forty-Yard Maze Run.

**23. Edgren's Ball Handling Test.

**24. Dodge Test.

C. *Jumping*

**25. Interception.

*26. Jump as for tie ball. Six balls are suspended so that they hang free of obstruction. The subject stands at the ball nearest her reach height. On signal, she jumps to touch the ball. One point is scored if she touches her "own" ball, with 1 additional point for each ball touched higher than her "own."

**27. Reach and Jump.

D. *Pivot*

28. The subject makes a head-on run of 12 feet toward a wall, receives the ball from a thrower (who stands 8 feet away from the place the subject receives the ball) and reverse-pivots and passes the ball to hit a target on the wall. The target is 3 feet square, with the lower edge 3 feet from the floor. The runner starts from a line 24 feet from the wall. Five tries. She is successful if the ball hits the target.

**29. Pivot-bounce.

E. *Throwing for Goal*

**30. The subject is scored on 10 throws for goal from the free-throw line.

31. The subject starts at the "ideal" spot and starts throwing for goal. The number of baskets made in 30 seconds is recorded.

32. The subject dodges around a jumping standard set 14 feet from a basket on a diagonal which forms a 45-degree angle with the end line. She bounces the ball toward the basket after dodging, and shoots for basket in one continuous motion after recovering the ball. Two points are scored if the basket is made; 1 point if the ball hits the backboard above the basket and near it. Five tries right and left.

33. The subject starts from a point 15 feet from the basket and on a diagonal which makes a 45-degree angle with the end line. She runs diagonally toward the basket and receives the ball from a thrower who stands on the free-throw line. The subject shoots for basket immediately. Five tries are given from each side and the number of baskets made is scored.

**34. Bounce and shoot.

35. A semi-circle 15 feet in radius with the center under the goal is marked on the floor. Five places are marked on the semi-circle. The subject shoots from No. 1, follows up, recovers, and shoots again. She repeats this starting from 2, 3, 4, and 5. The score is 2 for each goal made on the first shot, 1 for recovering the ball in the air, and 1 for each goal made on the follow up.

**36 Shoot for goal from the field.

B. TESTS SELECTED FOR EXPERIMENTATION PRELIMINARY TO ASSEMBLING A SHORT BATTERY OF TESTS

1. TESTING FOR THROWING AND CATCHING

A. *Speed*

Speed Pass (against the wall).—Push pass against a brick or other solid wall. Subject stands 6 feet from the wall and the number of throws in 30 seconds is scored. Two trials are given, at least 2 minutes apart.

Speed Pass (using two players).—Two persons, 15 feet apart, pass the ball between each other. The score is the number of passes made in 30 seconds. Three trials are given with 3 different partners.

B. *Accuracy*

Wall Target.—Subject stands 18 feet from a wall and takes 5 single overhand and 5 single underhand throws at a target of 4 concentric circles. The smallest circle has a radius of 10 inches, the next, 20, 30, and 40 inches, having the respective values of 3, 2, 1, 0, in the scoring. The center of the target is 4 feet from the floor.

C. *Timing in Throwing*

Moving Target.—Subject stands 10 feet from a swinging target and attempts to hit it with a ball as it is released from each side. The score is the number of times the target is hit in 10 trials. (See diagrams 7 and 8.)

D. *The Bounce*

Subject starts, ball in hands, with her feet in *C* and *C'* (see diagram 1). She bounces the ball directly ahead, recovers it and stops. The position of the forward foot is then noted and the number of the zone in which the toe of this foot rests is recorded. An illegal bounce scores zero. Five trials are allowed.

E. *The Juggle*

(See diagram 2 for arrangement of test.) Subject stands with her feet in the rectangles, left or right side to the standard depending upon whether she is left or right handed. She holds the ball in her hand, arm extended downward at the side,

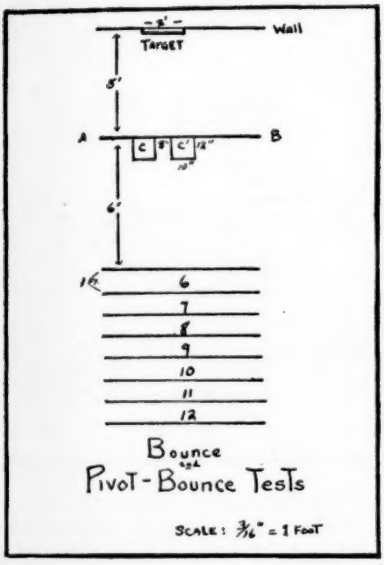


DIAGRAM 1

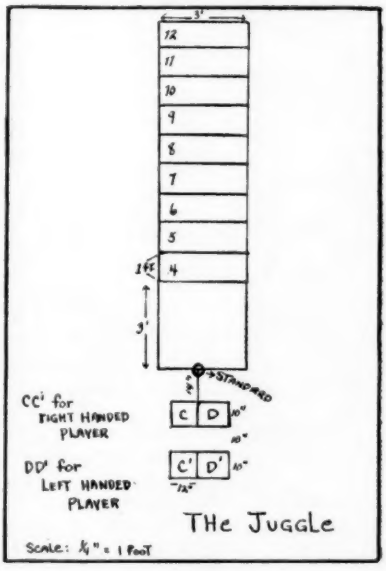


DIAGRAM 2

loops the ball over the standard and runs around the standard to her left (if right handed) to recover it. She must recover the ball within the width of the lane and before it touches the floor. The score is the number of the zone reached with a legal juggle. Five trials are given.

2. TESTS FOR HANDLING THE BODY IN RELATION TO THE BALL

A. *Moving Quickly*

Alden Forty-Yard Maze Run.—Subject is timed as she runs around 9 stools placed 9 feet apart on the floor.[1]

Edgren's Ball Handling Test.—Subject, standing 8 feet from a wall and to the left of a 6-foot area on the floor, throws the ball diagonally to the right of a 3-foot area on the wall, recovers the ball on the rebound at the right of the 6-foot area on the floor and throws the ball to the left side of the area on the wall. The score is the number of seconds taken to complete 10 throws at the wall.[9]

Dodge Test.—Subject runs between 6 stools (12 stools are used as they are placed 2 high) at different spots on the floor, and at varying distances apart, tapping twice each stool as she meets it, and returning to the starting point after tapping the sixth stool. The score is the number of seconds taken to complete the run. (See diagram 4.)

Moving Quickly and Changing Direction.—Subject stands at x (see diagram 5), the thrower stands at O. Ten balls are placed in a rack or frame which will prevent them from rolling, in front of the thrower, so that she can easily reach them. The

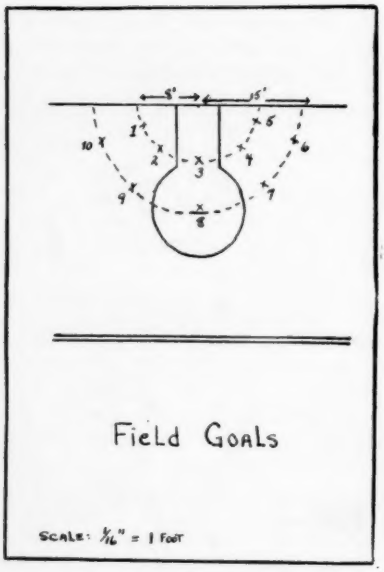


DIAGRAM 3

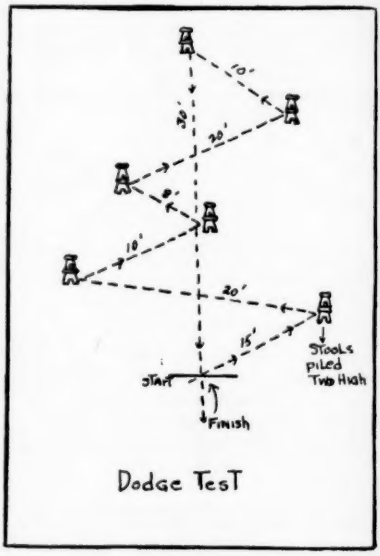


DIAGRAM 4

metronome is set at 120 and to ring in 4/4 time, i.e., every fourth count. The subject is told where the first ball is to come. The 10 balls are then thrown on the ring of the bell, alternately to the rectangles (A and B). The subject tries to keep the ball from striking the wall by batting it away or by catching it. She may move anywhere behind line CD, but may not come forward of it. The score for each throw is 2 points if the subject catches the ball, 1 if she bats it away, and 0 if she fails to keep the ball from hitting the wall.

Interception.—Subject attempts to guard a wall area of 15-foot width as the tester makes 10 throws to various spots on the wall. Three points are given for catching the ball, 2 if the subject legally recovers the ball, 1 if the subject bats the ball away, and 0 if the subject fails to intercept the ball before it touches the wall. (See diagram of throws, diagram 6.)

B. *Jumping*

Free Jump.—Subject stands, as for a jump for tie ball, beneath a series of suspended strips each 1 inch shorter than the one next to it, and jumps to touch one. Two jumps are allowed for each strip attempted and the highest jump (i.e., the shortest strip touched) is recorded.

Reach and Jump.—Subject stands facing wall or suspended blackboard and

with chalk in hand marks the height of her reach with her heels on the floor. Three jumps are allowed, each time marking with chalk the height of the jump. The score is the distance in inches and fractions of an inch between the reach and the highest jump.

C. *The Pivot-Bounce*

Subject stands facing the wall with one foot in each of the rectangles (*C*, *C'*) shown in diagram 1, with the ball in her hands. She throws the ball against the wall,

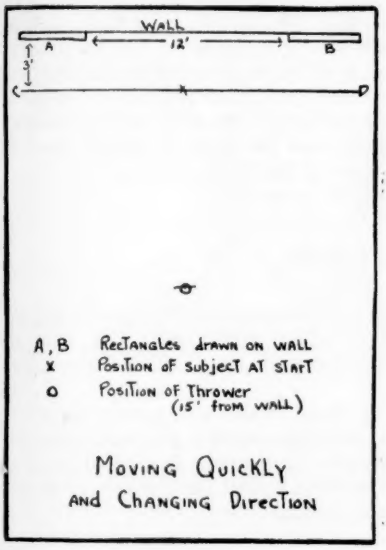


DIAGRAM 5

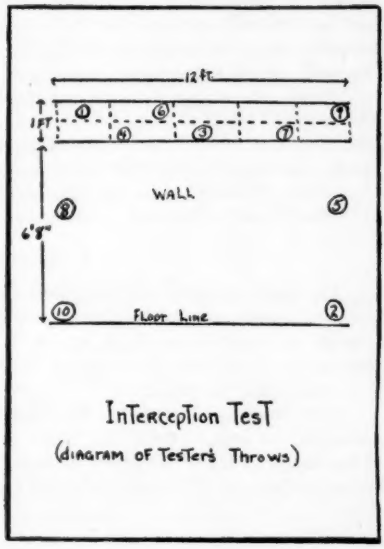


DIAGRAM 6

to hit within a target 2 feet wide by 3 feet long, drawn on the wall. The lower edge of the target is 4 feet from the floor. The subject catches the ball direct from the wall and turns (half-rear pivot), bounces, and holds. This is repeated 10 times, with the subject turning alternately right and left. For each successful attempt, the number of the zone reached on the bounce is recorded.

3. TESTS FOR THROWING GOALS

A. *Free Throw*

Ten throws at the basket from the free-throw line.

B. *Throws from the Field*

Bounce and Shoot.—Ten throws for goal, alternating right and left from marks 15 feet from the midpoint of the end line and on lines which are at 45-degree angles with the end line, measured from the midpoint of the end line.

Field Goals.—A ball is placed on each of the designated marks (see diagram 3). The subject stands behind the ball at number 1, and at the signal "Begin" picks up the ball and shoots as fast as she can, moving from ball to ball in regular sequence. Time is taken from the instant the subject picks up the first ball until she *releases* the tenth. The score is an index number: the number of goals divided by the time in seconds.

C. DETAILED DESCRIPTION OF THE SELECTED BATTERY OF FIVE TESTS

1. SPEED PASS (AGAINST WALL)

Personnel.—Timer, scorer.

Equipment.—Basketball, stop watch, whistle; chalk line drawn 6 feet from and parallel to a solid wall.

Procedure.—The subject, with the ball in her hands, stands facing the wall and behind the line drawn 6 feet from it. On the signal (whistle) she throws the ball against the wall, catches it as it rebounds, and continues throwing and catching until the signal to stop is given. If the ball does not rebound to the hands or is dropped, the subject recovers it and goes on. Both feet must be behind the line preceding each throw, but the standing position and type of pass used are not defined. The subject counts the number of times the ball strikes the wall. Another student also counts to check. Two trials of 30 seconds each are given, at least 2 minutes apart. The subject reports her score to the scorer at the end of each trial.

Score.—For each trial, the number of hits in 30 seconds.

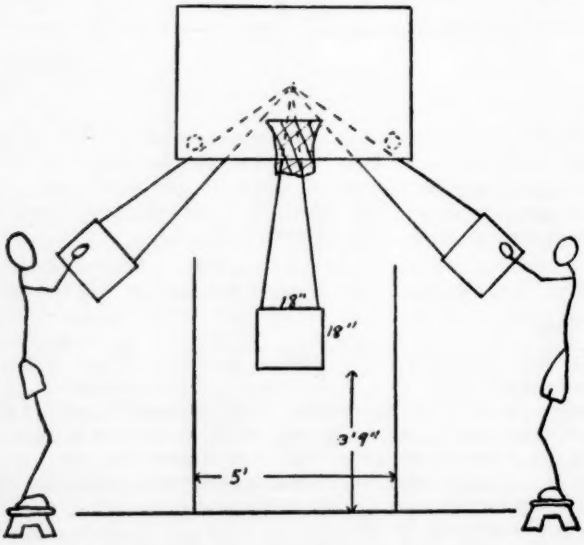
Final Score.—The sum of the scores of the 2 trials.

2. MOVING TARGET

Personnel.—Scorer, two assistants for the target.

Equipment.—Basketball, target, chalk lines. The target (see diagrams 7 and 8) is made of board 1 inch thick, and is 18 inches square. It is suspended by ropes so that its lower edge is 3 feet 9 inches from the floor. The point from which it hangs is 11 feet from the floor.

Two ropes are fastened to the target by means of half-inch harness snaps attached on the upper edge of the target to leather strips nailed to the front and back of the target. A large swivel-eye harness snap attaches the ropes to a metal ring 1½ inches in diameter. This ring is fastened by means of a short piece of rope (6 inches



Moving Target Test

DIAGRAM 7

long) to the rods that brace the backboard of the basket, at the place where they intersect. The length of each of these 2 ropes is 4 feet from the ring to the leather strips on the target. (The measurement includes the snaps on the end of the ropes.)

The swivel arrangement of the snap that attaches the ropes to the metal ring above, allows freedom in the swing of the target and prevents the rope from twisting. The rope is ordinary sash cord, number 8.

The weight of the target is approximately 4 pounds. It is reinforced on the back, top, and bottom, by pieces of wood (4″ x 18″ x 1″) placed across it.

A line 10 feet from the target is drawn on the floor from which the throws are made. (A perpendicular is dropped from the target as it hangs straight, the place where the perpendicular touches the floor is marked, and the 10 feet are measured from that point.)

Details of the Moving Target Test

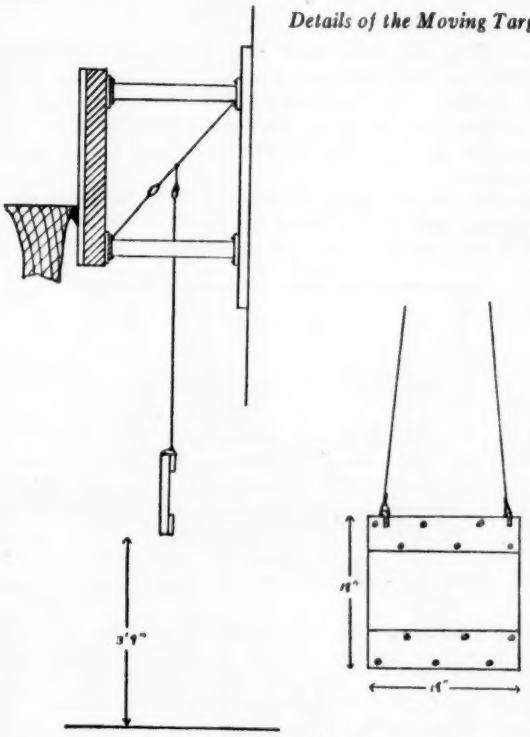


DIAGRAM 8

Two lines, 5 feet apart, are drawn on the wall behind the target, so that the midpoint between them lies directly behind a perpendicular dropped from the center of the target.

Procedure.—The subject stands behind the line, ball in hands. Two assistants (students taking the test) stand one on either side of the target. One of them draws the target to the side she is standing on, so that the rope on that side just comes in contact with the rod that projects from the wall to support the backboard. This means that the lower left or right hand corner of the target (depending on which side it is drawn back, and viewed facing it) is 6 feet from the floor preliminary to its release. The assistant holds the target between the flat palms of her hands and releases it by parting her hands. This prevents giving the target momentum. It

swings to the other side where the second assistant catches it and then releases it in the same manner.

The subject tries to hit the target as it swings from one side to the other and while it is passing through the 5-foot area marked on the wall. Two preliminary trials are given to accustom her to the speed of the swing. These trials are not scored.

No signal for the release is given, but the target is not released until the subject has the ball in her hands ready for a throw.

Any throw may be used; the subject must be behind the line while throwing.

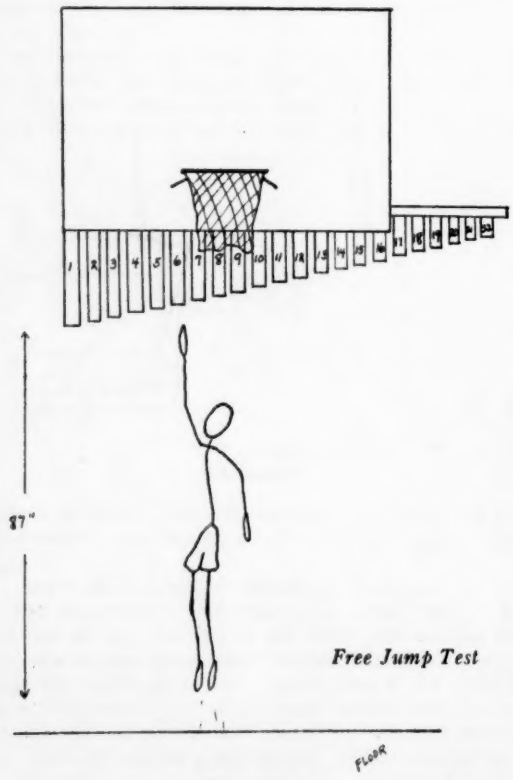
Score.—Number of times in 10 tries that the ball strikes any part of the target as it swings through its arc through the 5-foot area.

3. FREE JUMP

Personnel.—Scorer.

Equipment.—Strips of canvas made rigid by by pieces of wood glued to the back of each. They are numbered from 1 to 24, the longest one (number 1) being 87 inches from the floor. They graduate 1 inch so that number 2 is 88 inches from the floor and number 22 is 109 inches from the floor. They may be thumb-tacked to the lower edge of the backboard or anywhere there is free space in which to jump. (See diagram 9.)

Procedure.—The subject stands beneath the strip she thinks she can touch by jumping. (The scorer may tell her which one to try for.) She jumps to touch the strip of canvas. If she succeeds on the first or second try, she attempts a higher one.



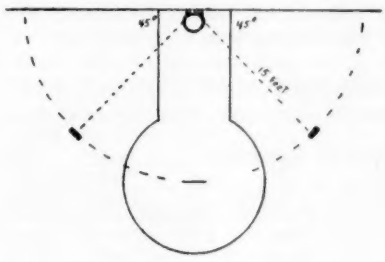
Free Jump Test

DIAGRAM 9

If she fails, she jumps to touch a lower strip. She must make the canvas swing before it is considered reached. She is given 2 tries at each strip attempted. She continues jumping until she fails on the second effort. If a number of jumps are made the subject should be given a chance to rest a bit. The number of the highest strip touched is recorded.

The jump is taken from a standing position beneath the strip. The subject may crouch to spring, but may not precede the jump by a run.

Score.—The number of the highest strip the subject touches.



Bounce and Shoot Test

DIAGRAM 10

4. EDGREN BALL HANDLING TEST

Personnel.—Timer and scorer.

Equipment.—Wall space, chalk lines, basketball, stop watch, and whistle. A chalk line is drawn 8 feet from and parallel to the wall. Two lines are drawn at right angles to this line and 6 feet apart. Where the wall space is behind a basket the free-throw lane may be used for these 2 lines. Two other lines, 3 feet apart, are drawn on the wall, enclosing an area which is equally distributed on both sides of the midpoint of the 6-foot lane. The letters "A" and "B" are marked on the floor to facilitate the giving of directions for the test. A diagram of the test will be found in Edgren's article.[9]

Procedure.—The subject with ball in hands stands at "A" facing the wall. On the sound of a whistle she throws the ball to the right of the area on the wall, at any height. She catches the ball on the rebound, and from "B" throws the ball to the left side of the area on the wall. She continues alternating 10 throws from left and right. If the ball is dropped or rebounds wide, she recovers it, carries it back to "A" or "B" and continues throwing. The 10 throws are timed. Time is begun with the whistle and ended when the tenth throw hits the wall. The timer counts the throws. When recovering the ball, the subject may run over the lines on the floor but must be at or beyond "A" or "B" when throwing the ball.

Score.—Time taken to complete 10 throws at the wall, measured in seconds and tenths.

5. BOUNCE AND SHOOT

Personnel.—Scorer.

Equipment.—Basketball, goal; 2 marks on the floor on either side of the goal. These marks are determined by drawing a semi-circle whose center is the midpoint of the end line and whose radius is 15 feet, then drawing radii which make 45-degree angles with the end line. Where the radii and circumference intersect, *x*'s are marked and straight lines a foot long are drawn. (The end line considered here is not corrected for the 1932–33 rules for women's basketball which require that

the end lines be 2 feet behind a perpendicular dropped from the backboard. Where the end lines have been corrected, for this new ruling, this test layout should be made from a point 2 feet inside the end line.)

Procedure.—Facing the basket on the right-hand side, the subject stands with the toe of her forward foot on the mark, ball in hands. She bounces the ball toward the basket and shoots immediately. If the bounce is markedly illegal, (i.e., the subject obviously runs with the ball or allows the ball to bounce twice) the trial is not counted and is taken over at the end of the 10 trials. The bounce in this test is used as a means of receiving the ball in motion. Ten tries for goal are given, the subject shooting from right and left sides of the basket, alternately.

Score.—Number of baskets made in 10 attempts.

D. T-SCORE EQUIVALENTS OF RAW TEST SCORES

Bounce and Shoot		Moving Target		Free Jump			
Test Score	*T-Score*	*Test Score*	*T-Score*	*Test Score*	*T-Score*	*Test Score*	*T-Score*
0	31.3	0	32.0	1	27.4	12	52.8
1	35.3	1	35.9	2	29.7	13	55.1
2	39.3	2	39.8	3	32.0	14	57.4
3	43.3	3	43.7	4	34.4	15	59.7
4	47.4	4	47.6	5	36.7	16	62.0
5	51.4	5	51.4	6	39.0	17	64.4
6	55.4	6	55.3	7	41.3	18	66.7
7	59.5	7	59.2	8	43.6	19	69.0
8	63.5	8	63.1	9	45.9	20	71.3
9	67.5	9	67.0	10	48.2	21	73.6
10	71.6	10	70.9	11	50.5	22	75.9
						23	78.2
						24	80.5

Edgren Ball Handling Test				Wall Speed Pass			
Test Score	*T-Score*	*Test Score*	*T-Score*	*Test Score*	*T-Score*	*Test Score*	*T-Score*
15″	71.6	30″	39.0	41	22.3	63	50.3
16	69.4	31	36.8	42	23.6	64	51.6
17	67.2	32	34.7	43	24.9	65	52.9
18	65.0	33	32.5	44	26.2	66	54.2
19	62.8	34	30.3	45	27.5	67	55.4
20	60.7	35	28.2	46	28.8	68	56.7
21	58.5	36	26.0	47	30.0	69	58.0
22	56.3	37	23.8	48	31.3	70	59.2
23	54.2	38	21.7	49	32.6	71	60.4
24	52.0	39	19.5	50	33.9	72	61.7
25	49.8	40	17.3	51	35.1	73	63.0
26	47.7	41	15.2	52	36.4	74	64.3
27	45.5	42	13.0	53	37.7	75	65.5
28	43.3	43	10.8	54	39.0	76	66.8
29	41.2	44	8.7	55	40.2	77	68.1
		45	6.5	56	41.5	78	69.3
				57	42.8	79	70.5
(.1″ = .22)				58	44.1	80	71.8
				59	45.3	81	73.1
				60	46.6	82	74.4
				61	47.9	83	75.6
				62	49.1	84	76.9

E. TEST DIRECTIONS TO THE SUBJECT

These directions were given to the subject by the tester. They were written in the form indicated and read to the subject before the test was demonstrated.

1. *Speed Pass (against wall).*—"This is a test for speed of passing. Stand behind the line. (Indicate.) On the signal, you are to start throwing the ball against the wall, so that it bounces back into your hands. Continue to throw and catch as fast as you can. Stop when the whistle blows. Use any way of throwing. If you drop the ball, go after it and continue as fast as you can. Keep behind the line. Count the number of times the ball hits the wall. You will have two trials altogether. Report your score to the scorer at the end of each. Ready?" (Whistle.)

2. *Moving Target.*—"In this test you are to try to hit the target as it swings from one side to the other. After starting, no signal will be given for the release—you will be ready to throw at any time. Use any way of throwing. The target will be released first from one side, then from the other. You may have two practice trials, then you will throw ten times. Stand behind the line while throwing. Take your practice trials now. . . . Now, ready for the ten throws? Begin."

3. *Free Jump.*—"In this test, you are to jump as for tie ball. Stand beneath the strip you think you can reach and jump to touch it. The strip must swing before it is counted touched. You may have two trials for each strip you attempt. If you fail you are to try a lower one. If you succeed, try a higher."

4. *Bounce and Shoot.*—"In this test you are to bounce the ball toward the basket, starting from this point (indicate) and shoot. You are to bounce and shoot immediately, recover the ball, and pass it back to the next person. Then go to the left side of the basket and wait your turn. You will have ten trials all together."

5. *Edgren Ball Handling Test.*—"This is a test for moving quickly. Start at 'A' and on the sound of a whistle throw the ball to the right and outside of the square on the wall, at any height. Catch the ball on the rebound and throw it to the left side of the square. Continue alternating ten throws from left and right. The ball is to be thrown from beyond this line (indicate) and outside of the free-throw lane. If the ball rebounds wide you may carry it to 'A' or 'B' before you throw it. Pass as quickly as you can; you will be timed. Ready?" (Whistle.)

F. JUDGES WHO RATED PLAYERS

The criterion for validating the battery was expert opinion. The following judges rated players and thereby established the criterion for validation:

Pauline Hodgson, Assistant Professor in the Department of Physical Education for Women at the University of California, nationally rated "A" basketball referee, and basketball coach in the Women's Athletic Association.

Anna Espenschade, Assistant Supervisor in the Department of Physical Education for Women at the University of California, nationally rated "A" basketball referee, and member of the Basketball Committee of the American Physical Education Association.

Bess Powell, Instructor in Physical Education, Balboa High School, San Francisco, nationally rated "A" basketball referee, and Chairman of the Basketball Examination Committee, San Francisco Bay Counties Board of Women's Officials.

Eugenia Kennan, Associate in the Department of Physical Education for Women at the University of California, and basketball instructor.

Dorothy Kilpatrick, Associate in the Department of Physical Education for Women at the University of California, and basketball instructor.

Genevieve Young, Oakland Recreation Department, nationally rated "A" basketball referee, and coach of basketball teams in Oakland and San Francisco industrial leagues.

The Effect of Oxygen Inhalation on Swimming Performance

By Peter V. Karpovich, M.D., M.P.E.
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THE FACT that the Japanese Olympic swimming team used oxygen inhalation before the contest and was so victorious aroused general interest in the effects of oxygen breathing upon athletic performance. As far as it could be learned the Japanese took the oxygen for five minutes about half an hour before the competition. Could such a procedure affect the speed in swimming? Some American coaches immediately decided that it could and stated that the Japanese swimmers were thereby "doped" and by means of this "unethical" method were able to make such a successful showing. This question has been presented to the writer on many occasions. In order to answer this and other concomitant questions the present investigation has been undertaken.

HISTORICAL FINDINGS

M. Pembrey and F. Cook (1908) found that after exercise it was much easier to breathe oxygen than air. The subjects in each case were unaware of what they were breathing. Leonard Hill and Martin Flack (1909) experimented with the effect of oxygen breathing upon the pulse, blood pressure, respiratory rate, athletic performance, and recovery from fatigue. The oxygen was administered for three minutes immediately before the exercise and also for four or five minutes during the recovery. The exercises used were running up and down a flight of twenty-six stairs eight or nine times, as fast as possible, and boxing. The subjects did not know when ordinary air and when oxygen was given to them. These investigators came to the conclusion that the effect of the oxygen breathing was a greater speed in running, lower pulse rate, and higher blood pressure. The subjective feeling was better and there was a quicker relief from dyspnea. In the case of boxing they stated that "oxygen given at the end of the third round to a 'done' man sends him back to the ring full of fire and energy."

C. G. Douglas and J. S. Haldane (1909) compared the effect of forced breathing of ordinary air with that of quiet breathing of oxygen. The duration of each type of breathing was three minutes. The exercise used was running up and down forty feet of stairs twice in seventy seconds. Their

conclusions were in favor of the forced breathing. The pulse rate was slower and came to normal more quickly with forced breathing than after oxygen breathing. The quiet inhalation of oxygen had a very slight effect if any.

Leonard Hill and J. Mackenzie, challenged by the above paper, investigated the effect of a forced breathing of air and a deep breathing of oxygen. They used three kinds of respiration: (1) quiet breathing of ordinary air; (2) forced breathing of air; and (3) deep breathing of oxygen. The duration of the latter two types was three minutes. After each of the respiratory preliminaries, the subjects lifted a weight of sixty pounds to a height of nineteen inches while holding the breath. Although the possible effect of fatigue was against the exercise with oxygen, because this was the last in the series, the results were definitely in favor of oxygen breathing, since the men could perform more foot-pounds of work. The subjective feelings were also better after oxygen. Experiments performed with runners were in favor of oxygen, because the men were able to run faster. Oxygen inhalation half an hour after the first run proved advantageous for the speed of the second run as compared with breathing of the ordinary air. It was also easier to hold the breath in a resting position after taking oxygen. After a forced respiration the record of breath holding was three minutes, whereas after oxygen breathing for five minutes, it reached nine minutes and three seconds.

Leonard Hill and Martin Flack (1910) found that a man after taking oxygen was able to run, holding his breath, 470 yards in 110 seconds. At the end of this run he continued wobbling about in an unconscious condition. They think that the preliminary oxygen breathing can be useful for running short distances only, not more than half a mile. They also state that the beneficial effect of oxygen inhalation may last for 15 minutes, citing for their proof that it was easier for a bicyclist to climb a hill so many minutes after taking oxygen.

Israel Feldman and Leonard Hill (1911) found that a preliminary inhalation of oxygen had a marked effect upon the amount of lactic acid voided with the urine after exercise. After a brief period of stair climbing there was almost no lactic acid and after a prolonged climbing there was very little, provided the oxygen had been given before the exercise.

Henry Briggs (1919) determined the amount of oxygen consumed by different persons while doing physical work and breathing either normal air or almost pure oxygen. He found that the thoroughly trained man received no advantage from breathing oxygen if the load was small or moderate, but, if the load was excessively large so that the work could be performed for a short time only, oxygen inhalation was beneficial and the subject was able to do more work. The non-trained man was helped a great deal by breathing oxygen even with small loads. The well trained man used less oxygen and gave off a higher per cent of carbon dioxide, indicating a better utilization of oxygen.

EXPERIMENTAL FINDINGS

The Effect of Oxygen Inhalation Immediately Followed by Swimming.—After a deep expiration the subject made two deep inhalations of pure oxygen and immediately plunged into water, holding his breath. The varsity swimmers were used as the subjects.

TABLE I
THE SPEED IN SWIMMING IMMEDIATELY AFTER TAKING OXYGEN

	Name	Stroke	Usual time in sec.	Best time in sec.	Oxygen time in sec.	Distance swum without breath.
*1	Br.	Crawl	61.0	59.0	59.3	135 ft.
2	De.	.....	60.0	58.0	57.7	135 "
*3	Ja.	.....	57.2	57.0	57.2	120 "
*4	Si.	.....	58.6	58.0	58.6	135 "
5	Li.	Breast	72.0	70.8	69.3	120 "
6	Ko.	Crawl	58.0	57.5	56.3	100 "
*7	Sc.	Back	71.0	70.0	71.1	20 "
8	Ho.	Crawl	55.0	53.8	53.1	100 "
9	Su.	Back	68.2	67.8	65.8	105 "
10	So.	Crawl	65.0	63.0	62.8	130 "
†11	Lo.	Breast	83.0	81.0	83.0	105 "
‡12	Wu.	.....	73.2	71.5	72.6	160 "
13	Gr.	Crawl	70.0	68.6	68.3	90 "
14	Pa.	.....	59.0	58.8	58.4	120 "
15	Ha.	.....	72.0	70.0	68.0	190 "
16	Pr.	.....	61.0	60.0	59.0	100 "
17	We.	.....	58.0	56.8	56.2	95 "

* Did not follow the instructions, exhaled the oxygen before hitting water.
† No account.
‡ Was not in good shape. On the same day made 100 yards in 76.5 seconds without oxygen.
A flying start was used throughout. The length of the tank was sixty feet.

From Table I it can be seen that in eleven out of seventeen cases men broke their own unofficial records. In two cases they bettered their usual time and in four they made their usual time.

Of the six men who could not break their own records, four did not follow the instructions and exhaled the oxygen before they hit the water, and one was not in good shape. (There was no account for the sixth man.) In this experiment the men knew that they were breathing oxygen and the criticism can be advanced that it was a purely psychological effect. This is a logical criticism but it cannot be applied to this experiment for this reason. Three out of the first four men in the series did not break their records and this created a skeptical attitude among the men who followed; yet as soon as the swimmers obeyed the instructions explicitly, the results became apparent.

The Effect of Oxygen Given Several Minutes Before the Swim.—Swimmers inhaled oxygen for a period of from three to five minutes and discontinued it four to five minutes before a hundred-yard swim, using

ordinary air in that interval. This procedure had no noticeable effect upon the speed of swimming.

The Effect of Preliminary Oxygen Breathing upon Running in Place While Holding the Breath.—In order to find the effect of preliminary oxygen breathing with an interval of ordinary respiration before the exercise, the following experiments were conducted. Men ran in place, holding the breath. The rhythm and the leg action were uniform. After a preliminary inhalation of oxygen *immediately* before the exercise the men were able to run for a longer period than after breathing ordinary air. When oxygen inhalation was followed by a one-minute interval of ordinary respiration the beneficial effect was very marked. After a time interval of two minutes the effect was slight in some cases and indefinite in most of the cases. After a period of three minutes or longer no effect was noticed.

TABLE II
THE PERFORMANCE IN RUNNING ONE MINUTE AFTER TAKING OXYGEN

	Names of the subjects							
	Vo.	Bu.	Ki.	Mi.	Pa.	Ur.	Vi.	Ka.
Without O_2 Time in sec.	29	33	38	38	49	38	41	40
With O_2 Time in sec.	52	36	48	49	62	68	80	51

The exercise used was a running in place holding the breath.
The figures represent the average time of several trials.

The Effect of Oxygen Breathing upon the Recovery.—After a hundred-yard swim, the men rested for ten minutes, then took pure oxygen for five minutes, then had another rest for five minutes, and then swam another hundred yards. This procedure was not sufficient for a complete recovery, but twenty-eight minutes of rest including five minutes of oxygen breathing were sufficient for a complete recovery; however the same period of time *without oxygen* was sufficient for recovery of some men. There was one marked advantage in oxygen breathing used immediately after a strenuous exercise: the men got quicker relief from the symptoms of distress.

The Effect of Preliminary Oxygen Inhalations on Speed in Actual Competition.—This was tried in four different intercollegiate meets, three times in the Springfield tank and once elsewhere. During the meet outside of Springfield all of the men but two showed a rather slow time regardless of whether they had taken oxygen or not. There were probably several reasons for that. One reason was that the weather was exceptionally cold and the men traveled in a small bus, practically without any ventilation, so that at the end of the trip seven men out of sixteen swimmers complained of headache. The second reason lies probably in overeating. On the day of competition some men had a slight case of diarrhea.

During the home meets, although some of the official pool records were broken, it is difficult to state what bearing this inhalation of oxygen had on the records. Only in two cases, when men started a relay race not many seconds after oxygen inhalation, was it possible to attribute part of their success to oxygen. Yet one man who lowered his time two seconds in a hundred-yard swim had had no preliminary oxygen inhalation. In analyzing the time records during the competitive meets we unfortunately do not know how fast the men would have swum on those occasions if they had had no oxygen.

DISCUSSION AND CONCLUSION

There is no doubt that oxygen taken immediately before strenuous exercise does benefit the person. It enables him to run or swim faster or perform more work in the same period of time. If the time interval between the oxygen inhalation and the exercise is short, say one minute, the effect may still last; with an increase in the length of the interval, the effect disappears very rapidly.

The nature of this phenomenon has often been misunderstood. Although L. Hill thought that oxygen could be stored in the body tissues, this was definitely disproved by numerous investigators. We now know that the breathing of oxygen does not increase oxygen consumption in normal people. Only when the partial pressure of oxygen in the alveolar air becomes too low and the rate of the blood circulation becomes too rapid and there are symptoms of want of oxygen will breathing of pure oxygen increase the consumption of this gas. The main purpose of preliminary oxygen breathing is to wash out carbon dioxide from the lungs and retain in the lungs as much pure oxygen as possible.

Suppose a man's vital capacity of the lungs is 500 cc. and his residual air is 1,000 cc., then the oxygen content of his lungs after a deep breath of air will be approximately 1,100 cc. The same man, after a thorough oxygen inhalation, will have almost 6,000 cc. of pure oxygen. Since the oxygen consumption at rest is about 225 cc. per minute, there is enough oxygen to last for 25 minutes. In reality the man will be able to hold his breath not longer than 10 minutes due to accumulation of carbon dioxide.

If, after oxygen inhalation, the person starts to breathe ordinary air in the normal manner, he will wash out the excess of oxygen from the lungs. This undoubtedly will take more than one minute. It can be verified mathematically. Suppose the tidal air is 250 cc. and the dead space is 150 cc.; then on every inhalation only 200 cc. of air enter into the alveoli and the same amount leaves the alveoli. If the respiratory rate is 10 per minute it is evident that it would take more than 1 minute to wash out the excess oxygen. Actual analyses of the expired air showed that there was, after 1 minute, 50.4 per cent and, after 2 minutes, 20.3 per cent of oxygen.

It is a well known fact that quiet breathing with a fully expanded chest

is extremely difficult. Consequently after a full inhalation there is a tendency to exhale about 1,500 to 2,000 cc. This leaves from 3,600 to 3,100 cc. of oxygen in the lungs. The above calculations hold true, in general, even for these figures.

The variation in the depth and respiratory rate explains why the effect of a preliminary oxygen breathing varies in different people and may vary in the same person, but there is no reason whatever to believe that its effect would last fifteen minutes as was suggested by L. Hill. Since there is no storing up of oxygen in the tissues, a prolonged oxygen inhalation is wasteful. The best results are achieved after several deep and rapid respirations. Some of the students in the writer's laboratory were able to hold the breath for six minutes and thirty seconds after three breaths.

The beneficial effect of the oxygen inhalation upon the speed in swimming may be explained in the following manner. In the first place it is a fact of common knowledge that respiratory movements retard the speed. Now oxygen inhalation makes respiration unnecessary for a certain length of time. Therefore the speed is increased.

In the second place there is more oxygen available; therefore more vigorous movements can be maintained longer. All the swimmers noticed that they could swim the first sixty yards much more easily. A. V. Hill suggested in this connection that a covered track filled with the oxygen would make for better records in running.

The effect of the preliminary oxygen breathing will be more noticeable in 100- and 220-yard swims. The 50-yard swim is too short and can be taken care of by a normal oxygen debt. In the longer distances, such as the 440, one should be careful because in this case the swimmer has a tendency to swim the first 100 faster than usual and this may upset the pace and increase fatigue at the end of the race. Ordinarily oxygen taken before a 100-yard swim reduces fatigue and lessens the stiffness in the arms, legs, and muscles of the jaw after the race.

The question has been asked as to the safety of oxygen breathing. It can be stated definitely that a few minutes of oxygen breathing cannot cause any harm. To call oxygen a "dope" is unwarranted.

Although it is beyond the scope of a physiological paper to go into a discussion as to what is ethical and what is not, nevertheless it might be asked that if the use of sugar is allowed in competition, why should oxygen be excluded?

In view of the fact that the Japanese took oxygen more than five minutes before swimming, it is safe to assume that the oxygen was not responsible in any way for their phenomenal speed.

SUMMARY

1. Oxygen inhalation immediately followed by swimming increases the speed in the hundred-yard dash.

2. Oxygen given four to five minutes before a hundred-yard dash has no noticeable effect upon the speed.

3. Oxygen breathing in actual competition, unless given at the start, is hardly worth while.

4. Inhalation of oxygen for five minutes after a hundred-yard swim has little effect upon the recovery, judging from a second hundred-yard swim twenty minutes later.

5. Oxygen breathing immediately after a severe exercise gives quicker relief from respiratory and circulatory embarrassment.

6. The effect of preliminary oxygen breathing lasts at least one minute, if the person remains quiet.

7. After three inhalations of oxygen a person can hold the breath in lying position up to six minutes and thirty seconds.

I wish to thank Coach T. K. Cureton, Jr. and his swimmers for the splendid cooperation given in the course of the present investigation.

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The Reliability and Validity of the Questionnaire Method

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THE USE OF THE QUESTIONNAIRE; ITS MERITS AND LIMITATIONS

THE QUESTIONNAIRE at the present time, both as a method of investigation in clinical medicine and for individual diagnostic study, is in ill repute. It is looked down upon by the medical profession at large as another one of those "psychological methods" and is listened to at medical meetings with the "lifting of the eyebrows." The disrepute into which the questionnaire has fallen in the eyes of the medical profession is largely to be laid to those who in search of easy information use the questionnaire as an "absentee landlord." A few questions are jotted down, mailed away to a number of colleagues, the answers are received, the positive separated from the negative, and another article is written. This is something quite different from a carefully devised, long studied questionnaire, the reliability of which is first assured by statistical analysis. It is of course obvious that any method to give sound results must be based upon sound observations and records.

The two questionnaires employed in the investigation and reported herein were six years in being perfected.* Quesionnaire No. 1 on "Health Habits" was based upon a long continued study of the detailed records of the daily lives of about five hundred Minneapolis school children of the ages from six to fifteen years.† The twenty-hour schedules of these children included the thirteen following items: (1) sleep, (2) food, (3) physical activities, (4) home study, (5) school social activities, (6) outside social activities (dances—theatres—movie—orchestra—work—radio), (7) other activities, (8) home duties and outside work for pay, (9) school attendance, (10) routine and fooling around, (11) transportation, (12) cultural activities, and (13) dress. This information was secured from the child and confirmed and made more complete by an additional questionnaire addressed to the mother.

* We wish to express our indebtedness for many valuable suggestions and criticisms to the following: Professors John Rockwell, Alvin Eurich, and M. J. Van Wagenen of the Department of Educational Psychology; Dr. R. E. Scammon, Dean of the Medical School, and Dr. G. E. Seham. We also appreciate very much the cooperation and the kindness of Mr. Carrol Reed, Superintendent of Schools of Minneapolis; Messrs. Albert Bank, Ross Young, and E. R. Edwards, Principals of the Sumner, Marshall, and Murray High Schools respectively; and all the teachers and children who gave of their time and their interest.

† The two questionnaires referred to from time to time are included at the end of the article.

The content of Questionnaire No. 2 known as "Health Efficiency" was obtained by a study of the records of children admitted to the Child Guidance Clinic and to our "Out Patient Department," and from private patients. The most common mild functional disorders were collected from these records and finally arranged through questions in the form which is here presented.

It is much more difficult to devise a questionnaire which will be satisfactory for diagnostic use with children than with adults. In the first place, it is very important that the questionnaire should fit the age, intelligence, and knowledge of the individual child. Our first questionnaires, devised for twelve-year-old children, were found to be unsuited for use with younger children. We were compelled to change the wording, and to eliminate some of the more difficult questions. In the second place, the wording of the questionnaire must be simple and direct. The questions must be skillfully put so as to elicit definite and unambiguous answers. A question such as "Do you notice improvement in your health since eating less candy?" will bring forth inconsistent answers from the majority of children. In the earliest form of one questionnaire we asked the question "Do things ever get misty before your eyes?" We learned that many children did not know the meaning of the word "misty," and upon substituting the word "black," we obtained a much higher consistency in the answers to this question. The same criticism holds with questions 5 and 7 in Questionnaire No. 2. There may be a difference of opinion as to what is meant by "giggling a great deal," and the phrase "find that you cannot help it" is unclear and may be interpreted in several ways. Our questions were so worded as to elicit three kinds of answers: (1) yes or no; (2) numerical answers; and (3) miscellaneous answers. In both forms 1 and 2 most of the questions required a simple yes or no. Some of the questions were used merely to reinforce the question preceding. These were really indifferent questions which were merely confirmatory and had no influence upon the rating.

In the third place, the length of the questionnaire should be given careful consideration. It should not be so long as to fatigue the child and yet it should not be so short as to militate against a comprehensive search of all the information that one wants. Our first questionnaire consisted of only 6 questions on "Health Habits" and 12 on "Health Efficiency." The reliability of the answers was too low for diagnostic use. Then we went to the other extreme and had 70 and 110 questions respectively. After having eliminated those questions which gave the highest discrepancies, we now present the final forms with 50 and 84 questions respectively.

METHOD OF PROCEDURE

In all, 413 children from the ages of 7 to 16 years were studied. We present in this paper the records of 260 because, for one reason or another, the remaining records were incomplete. Each child was given a

complete physical examination. He was weighed and his height taken at least once, many of them twice, and a number of the children (65) were in addition examined for the presence of tics and for their functional reactions. Each child answered both questionnaires on "Health Habits" and "Health Efficiency" twice within a week's time. Wherever any answers were doubtful the child was given a personal interview, and if necessary the answers were changed. In addition the school health records were made use of, especially in reference to the history of past illness and any medical treatment that had been given to the child either by the clinic or by a private physician. In about one-half of the cases we were also able to obtain completed questionnaires from the mother and from the school teacher.

Our method of procedure was as follows: We instructed the children as they sat in their classrooms to answer the questions as honestly as they knew how. We assured them that they would not be marked and that no one would know anything about the answers except ourselves. They were allowed to take all the time they needed and if they did not understand the questions, they were to ask one of us who was present at the examination. We gave the test during the first hour and we allowed the entire period. The younger children took forty-five minutes and the older children thirty minutes.

It is necessary at the outset to take the children into one's confidence by giving careful explanation of the purpose of the test and of some of the difficulties which they may meet. Some of the children who were unwilling to cooperate objected on the grounds that "It was another one of those tests," and stated that, unless they had to, they would not take it. If the respondent was unwilling or did not take the questionnaire seriously, the questionnaire was omitted. A small number answered carelessly and made facetious responses. These were, of course, not included.

While this was a written examination, each pupil got the benefit of an oral, and in some instances an individual, examination. We found that for the less intelligent and for the younger children the oral is more reliable than the written, but for those children who can write and understand the questions there is no higher reliability in the oral method than in the written. In office practice the oral can be used in combination with the written but in the study of a large number of children, it is impracticable to give individual oral sittings. This written method has an advantage over the informal method of history taking because of the fact that the voice often suggests what answer is wanted. If the child has been instructed in health education and he knows that he is not having as much sleep as he has been advised to have, he may not answer the question honestly.

THE PERCENTAGE OF SIMILARITY

The percentage of similarity is tabulated in Table I. It is lowest in the case of seven-year-old children. As can be seen it apparently increases

with age, being higher in the older child than in the younger, though the increase is not uniform from year to year. The reason may be that a child twelve years old and of average intelligence is likely to understand the questions as well as a child fourteen years old. That girls at the age of nine show a relatively higher percentage of similarity may be due to the fact that the sample was too small to be depended upon. The probable error (Table I, column 4) is relatively small for all ages except the eight- and nine-year-old children. This may be because children of that age may have more difficulty in understanding the questions.

TABLE I

MEANS, PROBABLE ERRORS, AND STANDARD DEVIATIONS FOR PERCENTAGES OF SIMILARITY FOR HEALTH HABITS

	Boys				Girls				Total
Age	N	M	PE_m	SD	N	M	PE_m	SD	
8					13	83.50	2.03	10.84	83.50
9	9	83.72	2.66	11.82	8	92.88	1.05	4.40	88.30
10	11	88.18	1.08	5.29					88.18
11	10	93.40	1.28	6.00					93.40
12	43	94.48	.62	6.04	37	96.08	.42	3.80	95.28
13	43	93.76	.61	5.95	30	94.30	.88	7.14	94.03
14	17	89.71	1.40	8.54	11	95.36	.67	3.31	92.53
All	142	91.99	.43	7.64	110	93.10	.47	7.28	

N equals Number — PE_m equals Probable Error of Mean
M equals Mean — SD equals Standard Deviation

PERSISTENCY OF ANSWERS IN TWO QUESTIONNAIRES

Ninety-six per cent of the total number of questions pertaining to health habits give a similarity score of between 90 and 100 per cent. The first 7 questions (13 per cent of the total number) have a perfect consistency (100 per cent similarity); in other words all of the 260 children answered these 7 questions in exactly the same way in the second questionnaire as they did in the first. The only questions which had a relatively low consistency were those in which answers had to be expressed in numbers. For example, the answers to questions 25, 27, and 44 require a knowledge of precise time relations. Questions 7, 17, 18, 31, 32, 46, and 48 which might be called "dummy questions," (see Table II) were not included in the final grading. They were inserted in this study merely to reinforce the questions.

THE VALIDITY OF THE QUESTIONNAIRE METHOD

In applying a method for the diagnosis of disease not only its reliability but also its validity must be established. To be valid the method used must have two characteristics: (1) It must yield a marked contrast between the normal and abnormal child. (2) The variability in the normal child must be low.

Table III shows the validity of the questionnaires in graphic form. The answers to the questionnaires of 100 miscellaneous normal children were compared with those of 100 children definitely abnormal. The latter suffered from underweight (weight-height index 10 per cent below average) and had definite signs and symptoms of functional disease. (They were not physically defective nor suffering from chronic infections but they were all functionally below par.) In the first section of the table,

TABLE II

THE INCIDENCE OF PER CENT SIMILARITY FOR HEALTH HABITS (520 QUESTIONNAIRES)

Per Cent Similarity	Numbers of Each Question	Total No. of Questions	Per Cent of Total No. of Questions
100	2-6-10-11-13-41-42	7	13
99	1-14-43	3	5
98	5-9-12-15-17-20-26-30-33-39-45-46-47-48-53	15	27
97	3-23-32-35-36-54	6	11
96	8-19-28-49	4	7
95	7-21-37-38-51-52-55	7	12
94	16-31	2	4
93	29-34-50	3	5
92	4-18-22-40	4	8
91	44	1	2
90	24	1	2
89		0	0
88	27	1	2
87	25	1	2

marked "Child," it can be seen that the average number of inadequate health habits for the normal group is 5.65 as compared to 9.7 in the abnormal. Likewise in the questionnaire for "Efficiency," the average unfavorable signs for the normal is 3.62 as compared to 9.09 for the abnormal. A similar contrast showing that the abnormal children have a lower score than the normal is found in the questionnaires answered both by the mother and by the school teacher.

THE CONTENTS OF THE QUESTIONNAIRE

Having shown that the validity and reliability of the case questionnaires is such as to justify their use for diagnosis the contents of the questionnaires will be discussed more in detail.

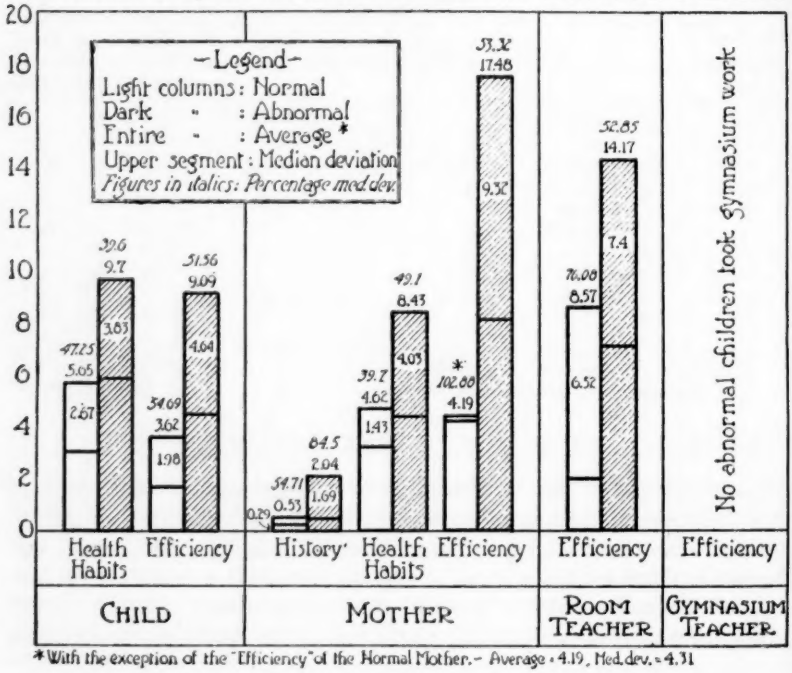
In attempting to use any key with which to decide what constitutes adequate or inadequate "Health Habits" we realize that there is a danger in attempting to use such a key literally. It must be admitted at the outset that the key which we have adopted as the health standard is an arbitrary one and that it does not necessarily represent the minimum or the maximum standard of physiological safety for all children.

We do not wish to give an impression that we believe that the schedule

used as a basis for comparison is the right or the best one for all children. We are using it merely to seek information as to what possible disorders may be found among children whose mode of living deviated from this standard. The fifty-five questions in Questionnaire Number I pertain to the six most common "Health Habits" or health activities in the life of the average child of school age, namely sleep, food, out-of-school physical activity, home studies, social activity, chores, and outside work for pay.

TABLE III

COMPARISON OF QUESTIONNAIRES OF NORMAL AND ABNORMAL SUBJECTS



*With the exception of the "Efficiency" of the Normal Mother.- Average = 4.19, Med.dev. = 4.31

GRADING AND SCORING OF THE QUESTIONNAIRES

In scoring the answers to the questionnaires and in evaluating them, it is important to know what terms a child might use to answer a question in the affirmative or in the negative, and how the child might express himself to indicate that he is in doubt about the answer. Through personal contact with a large number of children the following information was obtained. A positive answer might be expressed in any of the following four forms; "sure," "of course," "sometimes," and "very seldom." An answer may be considered negative if the answers are such as "never," "I don't know," and a dash(—). Two methods were used in scoring. First, all unfavorable answers were checked and added up. Since in the

questionnaire on health habits there are 55 questions, each question represents a score of 1.8, in that of efficiency (with a total of 91 questions) 1.1 per cent. For example, if in the questionnaire on health habits but 2 answers were unfavorable, the child scored 96 per cent. The average percentage scores are practically the same for all ages. However, this method of scoring is quite lengthy and time consuming. It was therefore thought desirable to use a method which would lead to the desirable information with less expenditure of time. For this purpose the questions were divided into 6 groups, each group representing a different function, e.g., sleep, food, etc., and each function receiving a score of 16.6 per cent. Thus the child scored on the basis of each function rather than on each item. For example, if the child answers unfavorably 1 or more vital questions in the section on sleep, his score would be 83.6 per cent. If there are any unfavorable answers in 2 sections, e.g., sleep and food, his score would be 66.8 per cent. The average correlation of both methods was found to be .66 which is significant. It would undoubtedly be higher if more than 6 items had been considered.

It might be well to mention here that no importance must be placed on the actual score. It does not matter much whether a child scores 67.2 or 83.6. What really matters is the information obtained concerning the health of a child.

THE QUESTIONNAIRE FOR HEALTH EFFICIENCY

The questionnaire on efficiency (Number II) is composed of 91 questions covering 12 health functions. These questions are directed towards those signs and symptoms of functional disorders which most commonly afflict children of school age. They appear in the questionnaire in the following order: (1) General Health, (2) Social Maladjustment, (3) School Efficiency, (4) Headaches, (5) Growing Pains, (6) Seat and Desk Maladjustment, (7) Defective Vision, (8) Defective Hearing, (9) Fatigue, (10) Idiosyncrasy to Food, (11) Nervousness, (12) Circulatory Symptoms. As can be seen there are a number of apparently unnecessary questions. These questions were purposely introduced to reinforce the topic question. For example, in the section on "Headaches," we asked 6 questions so that if the child did not understand 1 question, he would be likely to understand 1 or more of the remaining. Moreover the examiner is helped in his interpretation if he has a larger number of answers to judge from. Such questions as 2, 9, 14, 20, and 46 are what we might call "padded" questions.

The contents of this questionnaire are divided into three groups representing:

(1) The subjective feeling or attitude of the child, expressed in such questions as 2, 3, and 8. For example, "Do you always feel well and strong?" "Are your feelings ever hurt so badly that you cry?" "Do you think that you are easily excited?" Obviously such questions may bring

forth a variety of answers. The present state of health, the particular mood, or the general attitude towards health may influence the child's answer. Contrary to expectation, however, the consistency in the answers to these particular questions was over 90 per cent (Table No. IV).

(2) The knowledge of the child as regards his pains or discomforts, calling forth yes or no for an answer, for example, numbers 22, 27, and 30. "Do you ever have headaches?" "Do you ever have backaches?" "Do you ever have pain in your arms?" Here again one might suspect that young children might not discriminate accurately between different types of sensory disturbances. However, our calculations show that such questions are answered with a similarity of between 90 and 100 per cent (Table No. V). Questions 27 and 28, referring to backaches, were answered in the same way in both questionnaires in every single instance. The questions on headaches, even in the younger children, were answered with a similarity of 97 per cent for question 21, 83 per cent for 22, 97 per cent for 23, and 92 per cent for question 24.

TABLE IV

MEANS, PROBABLE ERRORS, AND STANDARD DEVIATIONS FOR PERCENTAGES OF SIMILARITY FOR HEALTH EFFICIENCY

	Boys				Girls				Total
Age	N	M	PE_m	SD	N	M	PE_m	SD	
8					13	88.88	1.59	8.50	88.88
9	9	87.06	1.16	5.14	8	91.25	1.82	7.64	89.03
10	11	88.82	1.58	7.76					88.82
11	10	94.90	1.52	7.13					94.90
12	43	93.73	.38	3.74	41	92.78	.51	4.81	93.27
13	42	92.12	.65	6.28	30	92.17	.77	6.26	92.14
14	17	89.82	.84	5.15	11	92.27	.72	3.54	90.73
All	141	91.61	.36	6.26	114	91.92	.39	6.24	

M equals Median SD equals Standard Deviation
PE_m equals Probable Error

(3) The third group of questions demands answers that require more objective replies, such as numerical answers; for instance, questions 21, 23, and 28, "How often do you have headaches?" "How often do you have backaches?" "How many minutes or hours does your headache last?" Though the consistency of the answers in this group is lower than that of the preceding groups, the average percentage of similarity is about 85. To summarize Table No. IV, the average percentage of similarity is slightly lower for the children below the age of 10. In general the age does not seem to affect the consistency of the answers in either questionnaire, the average similarity being 91.61 per cent. The important point which is brought out in this table is the fact that in all ages above 8 years, the consistency is high enough to justify the use of this method

for diagnostic purposes both *en masse* in the schoolroom as well as for the individual child in office practice.

SUMMARY AND CONCLUSIONS

1. The two questionnaires presented in this article, one for "Health Habits" and the other for "Health Efficiency," have been shown to be reasonably reliable and valid.

2. Thirteen per cent of the total number of questions in the "Questionnaire of Health Habits" have a percentage similarity of 100; 96 per cent have from 90 to 100; the average percentage similarity for all questions

TABLE V

THE INCIDENCE OF PER CENT SIMILARITY FOR HEALTH EFFICIENCY (520 QUESTIONNAIRES)

Per Cent Similarity	Numbers of Each Question	Total No. of Questions	Per Cent of Total No. of Questions
100	27-28-48-64-65-69-71	7	8
99	18-25-55-60-73-79-83	7	8
98	7-9-17-19-26-37-43-62-63-67-75-78-80-91	14	15
97	11-20-21-23-41-84	6	7
96	3-50-90	3	3
95	6-13-15-30-47-49-57-86	8	9
94	2-5-16-32-42-45-56-81	8	9
93	12-14	2	2
92	4-24-35-46-52-53-58-70-82-88	10	11
91	44-51-76	3	3
90	1-31-36-59-61-66-89	7	8
89	38-68-72	3	3
88	39-54-85	3	3
87	10	1	1
86	8-29-34-77	4	4
85	40	1	1
84	74	1	1
83	22-33-87	3	3

is 91.61 with a minimum of 83.5 per cent for the 8-year-old and a maximum of 95.28 per cent for the 12-year-old children.

3. Eight per cent of the total number of questions in the "Questionnaire on Health Efficiency" have a percentage similarity of 100; 84 per cent have from 90 to 100; the average percentage of similarity for all questions is 91.76 with a minimum of 88.88 per cent for the 8-year-old child and a maximum of 94.9 per cent for the 11-year-old children.

4. The validity of the questionnaire is shown by the fact that:

a) The average number of inadequate health habits in abnormal children is 9.7 as answered by the child, and 8.43 as answered by the mother, as compared to 5.05 and 4.62 respectively in the normal child.

b) The average number of functional disorders in abnormal children is 9.09, 17.48, and 14.17 (as answered by the child, mother, and teacher respectively) as compared to 3.62, 4.19, and 8.57 in normal children.

5. The average percentage score for health habits for all children with the first method was 85.22 (for boys 82.72, for girls 88.31), and the corresponding figures for the second method were 73.68 (71.10 for boys and 76.87 for girls).

6. The average correlation between the first and second methods was .66.

7. The difference between the scores of the two methods was due to the fact that the number of items used in the first was 55 and only 6 in the second.

8. The average percentage score for "Health Habits" as obtained from the mother's questionnaire (second method) was 84.29 (82.35 for the boys and 87.03 for the girls).

9. The correlation between the percentage scores for "Health Habits" as obtained from the child and the mother is .65 (first method) and .60 (second method).

10. There is no significant difference in adequacy of "Health Habits" on the basis of scholarship or grades in school.

11. The relationship between the intelligence quotient on the one hand and (a) the average percentage similarity and (b) the average percentage score of "Health Habits" on the other is of no significance.

12. The average percentage scores in "Health Efficiency" for all ages as obtained from the child is 85.25 (for the boys 84.62 and for the girls 86.01). The corresponding figures as obtained by the second method were 74.52 (for the boys 74.18 and for the girls 74.93).

13. The correlation between the two methods is .89.

14. The average percentage scores in "Health Efficiency" as obtained from the mothers' questionnaires is 88.46 (being 88.66 for the boys and 88.19 for the girls).

15. The correlation between the percentage score for "Health Efficiency" as obtained by the child and the mother is .65 (first method) and .60 (second method).

QUESTIONNAIRE OF "HEALTH HABITS"
(To be answered by the Child)

No. 1

Name..... Age..... School .....
Address..... Grade..... Date.....
(1) What time do you get up in the morning? No later than 7 o'clock .....
(2) What time do you eat breakfast? No later than 7 o'clock .....
(3) How long does it take you to eat breakfast? No less than 15 minutes ....
(4) What do you eat for breakfast? Mention the last breakfast you ate.
(1) Milk, fruit, and one other article .....
(5) What time do you eat the noon meal? .....
(6) How long does it take you to eat the noon meal? No less than 20 minutes

(7) Do you eat the noon meal at home or at school? .....
(8) What do you eat for the noon meal? Mention the last noon meal you ate.
(1) Milk, at least one vegetable, one other article .....
(9) What time do you eat supper? No later than 7 o'clock .....
(10) How long does it take you to eat supper? No less than 30 minutes .....
(11) What do you eat for supper? Mention the last supper you ate
(1) Meat, vegetables, desert, milk .....
(12) What vegetables do you eat? Mention each separately.
(1)..... (2)..... (3)..... (4) At least four vegetables
(5)..... (6)..... (7).....
(13) How many pieces of candy do you eat a day? No more than 3 .....
(14) At what time of day do you eat candy? Not between meals .....
(15) How many cups of coffee do you drink daily? Not more than 1 cup .....
(16) How many glasses of milk do you drink daily? No less than 3 .....
(17) How often do you use medicines for your bowels? Not more than once a month .....
(18) How often do you take a rest or nap in the daytime? .....
(19) How many hours a day do you play out of doors? No less than 1, no more than 3 .....
(20) How many hours do you play indoors? No more than 1 hour .....
(21) How many hours do you spend in home study? Depends upon age .....
(22) When do you do your home study? Preferably in the afternoon .....
(23) How many clubs do you belong to? No more than 1 .....
(24) How many times a week do you meet with your club? No more than once
(25) What time of day do you meet with your club? Preferably afternoon ....
(26) How much time do you practice on your musical instrument? No more than 1 hour day
(27) At what time of day do you practice on your instrument? Preferably afternoon .....
(28) What days of the week do you go to the movies? Only week-ends (once)....
(29) What time of day do you go to the movies? Only afternoons .....
(30) How often do you listen to the radio? .....
(31) What time of day do you listen to the radio? Not later than scheduled bed-time .....
(32) How far do you live from school? .....
(33) Do you walk to and from school? .....
(34) What work do you do at home for your mother? .....
(35) How long does it take you to do this work? Not more than 1 hour daily
(36) What time of the day do you do this work? Not before school or in the morning .....
(37) What do you do after supper? .....
(38) What do you do before breakfast? No work should be done .....
(39) What work do you do for pay? No outside work .....
(40) How long does this work take you? .....
(41) How much do you earn a week? No work for pay outside home .....
(42) How many parties in the evening do you go to in a month? No more than 2 a month .....
(43) What time of the week do you go to parties? Only week-ends.....
(44) How late do you stay at the party? No later than scheduled time for sleep
(45) How many books do you read a week? .....
(46) Do you sleep with your window open? Window should be opened .....
(47) Does anybody sleep in the same bed with you? Should sleep alone .....
(48) How many sleep in the same room with you? Should sleep alone in room
(49) What time do you go to bed? See schedule .....
(50) How long does it take you to fall asleep? No more than 30 minutes .....

QUESTIONNAIRE OF "EFFICIENCY"

(To be answered by the Child)

No. 2

Name..... Age..... School.....
Address..... Grade..... Date.....

(1) Do you always feel strong and well? Yes .....
(2) Why don't you feel strong and well? I always do.....
(3) Are your feelings ever hurt so badly that you cry? No .....
(4) What hurts your feelings so that you cry? Nothing .....
(5) Do you often get cross over little things? No .....
(6) What makes you cross? .....
(7) Do you giggle a great deal and find that you cannot help it? No .....
(8) Do you think that you are easily excited? No .....
(9) What excites you easily? .....
(10) Do you make friends easily? Yes .....
(11) Do you keep your friends long? Yes .....
(12) Do you find school a hard place to get along in? No.....
(13) Are you anxious to get away from school? No .....
(14) Why are you anxious to get away from school? I am not .....
(15) Do you like your teachers? Yes .....
(16) Is it hard for you to pay attention to the work in school? No .....
(17) Is it hard for you to learn? No .....
(18) Is it hard for you to remember things? No .....
(19) Do you finish what you start out to do? Yes .....
(20) Why don't you finish what you start out to do? I do .....
(21) How often do you have headaches? Never (once a month) .....
(22) Do you ever have headaches? No .....
(23) How many minutes or hours does your headache last? .....
(24) At what time of the day does your headache come on? .....
(25) Do you get a headache after reading? No .....
(26) Do you get a headache after play? No .....
(27) Do you ever have backaches? No .....
(28) How often do you have a backache? Never (once a month) .....
(29) When does you backache come on? Never have them .....
(30) Do you ever have pains in your arms? No .....
(31) How often do you have pain in your arms? Never (once a month) ....
(32) When does the pain in your arms come on? Never have them .....
(33) Do you ever have pain in your legs? No .....
(34) How often do you have a pain in your legs? Never .....
(35) When does the pain in your legs come on? Never have them .....
(36) Do any of your muscles ache when you are sitting at your school desk? No..
(37) How often do your muscles ache when you are sitting at your school desk? Never .....
(38) Do your desk and and seat hurt you? No .....
(39) When do your desk and seat hurt you? Never .....
(40) Is your desk too high for you? No .....
(41) Is your desk too low for you? No .....
(42) Do your feet touch the floor when you are sitting at the desk? Yes ....
(43) Do you feel cramped in your seat? No .....
(44) Can you read the writing on the blackboard from where you sit? Yes ....
(45) Do your eyes hurt you during reading in school? No .....
(46) Do you have to hold your book close to your eyes when you read? No ..
(47) Do you have to hold your book far from your eyes when you read? No ..
(48) Do things ever get black before your eyes? No .....

(49) When do things get black before your eyes? Never .....
(50) Can you hear the teacher from where you sit? Yes .....
(51) Can you hear the other children recite from where you sit? Yes .....
(52) Do you get sleepy in school? No .....
(53) Do you get tired in school? No .....
(54) When do you get tired in school? Never .....
(55) Do you feel tired at noon? No .....
(56) Do you feel tired after luncheon? No .....
(57) Why do you feel tired after luncheon? I don't .....
(58) Do you feel tired after school is out? Either, yes or no .....
(59) Do you feel tired in the evening before going to bed? Yes or no .....
(60) Is it hard for you to get up in the morning? No .....
(61) Why is it hard for you to get up in the morning? It is not .....
(62) Do you feel sort of tired a great deal of the time? No .....
(63) Do you usually sleep well? Yes .....
(64) Are you hungry when you sit down at meal time? Yes .....
(65) Do you enjoy your meals? Yes .....
(66) What foods make you sick to your stomach? None .....
(67) How often do you get sick to your stomach? Never .....
(68) Can you sit still without moving around all the time? Yes .....
(69) Do you play with the things on your desk a great deal? No.....
(70) Do you bite your finger nails? No .....
(71) Do you bite your lips? No .....
(72) Do you suck your thumb? No .....
(73) Do you pick your nose? No .....
(74) Do you pick your face? No .....
(75) Do you get out of breath quickly? No .....
(76) When do you get out of breath? Only after running.....
(77) When does your heart pound so that you can hear it? After playing ....
(78) How often have you fainted away? Never ..Have you ever fainted? No
(79) How old were you when you fainted away? I never have .....
(80) Why did you faint away? I didn't .....
(81) Do you get dizzy often? No .....
(82) When do you get dizzy? I don't .....

The Placement, Follow-up, and Guidance of Teachers*

By Grace E. Chevraux
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I. THE PLACEMENT OF TEACHERS

THE EDUCATIONAL institution in its rapid growth in recent years has raised its standards, selected its students more carefully, increased its faculties, and bettered its facilities. With increasing high standards in education, a more proficient teacher has been in demand. Consequently, the institutions for training teachers have had to make an intensive survey of their field, in the light of improving the nature and the quality of their training and the teaching that resulted from it. From these findings, the institution and the state are recognizing that "placement is a field contact of a necessary and valuable kind,"[1] and consequently they are now attempting to establish and improve such service.

In a recent survey[2] reported by Davis, "Placement and the In-Service Follow-up" was found to be one of the three major problems that confronted the teacher-training field in physical education. The institution, the student, and the state share a responsibility towards this particular phase of education.

The institution has an obligation to its graduates. It has accepted and permitted a student to pursue and complete a course in teacher training. The student may rightfully believe he is qualified for a teaching position. The institution from which the student receives his training is best qualified to know the type position for which he is best suited. In addition it knows something of the personal qualities, capacities, and needs of the individual. "One of the objectives towards which the National Education Association is working is a well trained teacher for every classroom in America."[3] The institution can help achieve this end through a well directed placement bureau. An educational institution has a responsibility to society. It is its duty to see that students are placed in positions for which they are adequately prepared. By knowing the qualifications of the individual, and the wants of the employer, the placement agency of the institution is in the best position to nominate the candidate for the posi-

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* Term paper submitted at Teachers College, Columbia University, 1933.

[1] R. W. Fairchild, "Field Contacts as Sources for Employment of Teacher Education," *Educational Trends* (January, 1932-May, 1933).

[2] Elwood Davis, "Survey and Professional Preparation in Physical Education," Research Quarterly, II:4 (December, 1933) 21.

[3] W. H. Adams, *Placement of Students in Teaching Positions*, p. 9. Abilene Christian College, 1933.

tion. The placement bureau assists the employer by furnishing him with information about likely candidates for the position. Through the medium of the placement bureau, the registrant is only nominated for positions for which she is adequately trained,[4] the employer is given a list of only qualified candidates, and the children to be taught are considered in the light of the placement of the teacher. Lastly, the reputation of the institution is built on a teacher's success or failure.[5]

The conclusions of two studies[6] may clarify the more general practices in the field relative to teacher placement. The first is a survey[7] conducted by Adams in 715 institutions including normal schools, colleges, universities, teachers' colleges, etc. The conclusions reached are as follows:

1. Eighty-seven per cent make adequate provision for placing of students.

NOTE.—Teachers College (example of graduate school in physical education) has centralized agency for placement. Service is free to registrant. The Ohio State University (example of undergraduate school in physical education) has centralized agency for placement.

2. "Only 4.8 per cent require all students to register with placement office."

"Fourteen and five-tenths per cent require all graduates."

3. "Four and seven-tenths per cent faculty members make placements independent of placement offices."

NOTE.—Department of hygiene and physical education acts as its own placement bureau. Chairman is informed of many changes and new openings as they occur. Likewise, by her close association with the students, she is enabled to learn their preferences and capacities and then assists them to locate more satisfactorily.

4. "Administrative officers are directly in charge of placement in 53.2 per cent of institutions."

5. "Ninety per cent of institutions pay all or part of expenses of teacher placement. Only 32.2 charge those who register, median is 1.84."

6. "Thirty-eight directors will nominate no one for a position if the candidate has not majored in field."

"Fifty-three nominate those who minored."

"Twenty-one nominate candidates in closely allied fields."

7. "One hundred and fourteen institutions who reported both calls and placements filled 37.3 per cent of calls. One hundred thirty-five directors reported 63.6 first time registrants in office secured positions."

8. "The typical director is married and is forty-three years of age. He is a graduate of a private college or university, and holder of a master's degree, has had seventeen years of experience in four different positions, and generally teaches one or more courses in some field."

The typical placement bureau in attempting to place a student as found by Umstattd[8] in a study of teacher placement in 166 institutions, uses objective, subjective type of credential, and sometimes only subjective. A transcript of credits is included in the credentials. Intelligence scores and photograph are generally included. Health record and non-

[4] *Ibid.*, p. 63.

[5] *Ibid.*, p. 53.

[6] *Ibid.*, p. 76-92; J. G. Umstattd, *Teacher Placement in 166 Institutions*, pp. 13-30. Univ. of Minnesota, Feb. 1932.

[7] *Ibid.*, pp. 76-93.

[8] J. G. Umstattd, *Teacher Placement in 166 Institutions*, pp. 13-30. University of Minnesota, Feb. 1932.

intelligence test, e.g., test of interest, aptitude, etc., were used by the minority as found in this study. The cost of placement per graduate ranged from one to seventy-five dollars. Average salary range for appointment from a state university was $1,480. Median for normal school was $1,105. The elementary teachers were first in demand, and, second, the teachers in special subjects.

The first responsibility of the student towards the teacher-placement service is to register with the institution placement service, supplying all of the required data in complete form.

The second responsibility is to honestly accept only positions for which he has been adequately trained. Acceptance of a position for which he is not prepared generally results in an unsuccessful experience for him, unfavorable reflection on the institution, and the lowering in general of the standards for teaching. In the event the state has a placement bureau, the student should file the necessary credentials with the state. The question of registering with a commercial agency is debatable inasmuch as this bureau does not know the qualifications of the registrant as well as the institution. In addition, if the teaching standards are to be raised, this practice is debatable, because remuneration depends on the placements effected; and irrespective of the training for the position, the commercial agency will endeavor to place the individual.

The state accepts both the training of teachers and the certification of teachers as a part of its function, but it has failed to recognize the placement and follow-up as an equally important responsibility. The people of a state are taxed to defray the educational expense of training teachers and, after training, it allows them to secure positions as best they may. This in itself is an unsound economic principle. The widespread oversupply of teachers might have been avoided to some degree if adequate surveys had been conducted by the state in regard to teacher placement and follow-up.

Consequently some states[9] are reporting an oversupply in English and history and an under supply in home economics, agriculture, etc. Bollon[10] of Oregon reports an under supply in physical education in five western states.

The function of the state is to establish an agency under the state board of education and to require all prospective teachers to register with this state agency,[11] filing all necessary credentials. Any employer could register his needs, and a list of the qualified candidates could be sent to him or appointments with candidates could be made. In this way an effective check of supply and demand of teachers could be made. Surveys

[9] "Supply and Demand of Teachers," *Bureau of Educational Research Bulletins*, Ohio State University, IX (Nov. 5, 1930) 446.

[10] "Supply and Demand of Teachers," *Bureau of Educational Research Bulletins*, Ohio State University, IX (Nov. 5, 1930) 447.

[11] E. McCarrol, and M. McCloud, "Teacher Placement by State Agencies," *Bureau of Educational Research Bulletins*, Ohio State University, IX (Nov. 5, 1930).

of public school systems could be made and desirable qualifications for a particular position might be noted. This bureau would render a service to society. Its files would serve as a basis for reseach for future predictions of supply and demand. It would serve the employer, who would not have to write to a number of institutions to secure candidates, but only to a state agency, stating his needs. A service would be rendered to the prospective teacher in listing her name as a possible candidate for a position, and lastly, an extra service to prospective teachers would be given in the publishing of all information for guidance of high school students in their selection of a vocation. From this data, a reasonable balance might be achieved between supply and demand, fields would be more equally divided, and superior teaching would result.

II. THE FOLLOW-UP SERVICE

Equally as important as placement of the student is the follow-up service which should be conducted by the institution and the state. This service, however, is more commonly lacking than the placement service in the institutions and the state. Dr. Whitney, in a survey,[12] of 138 teachers colleges found that 33 per cent had no plan for following their graduates into service. The state is less concerned as evidenced by the findings of Dr. Higbie[13] which disclosed the fact that out of 41 states, only one or two states are doing anything with follow-up work. There is a growing need in the teacher-training field to provide some method of follow-up service. "This service is generally recognized as having a threefold value, namely, the value to the graduate, the benefit to the school system where the graduate is teaching, and the good that comes back to the college due to the correcting of common types of weakness."[14]

It is to the interest of each institution to establish a follow-up service. The reputation of the institution is built on the ability of its graduates to teach successfully in service. Now that the institution has recognized placement as an important phase of its work, its next duty is to follow up and discover whether the teacher is poor, mediocre, or superior. Frequently minor difficulties are the cause of a student's failure in her first job. Through follow-up service, either through visitation or correspondence, adjustments might be made where the situation would be greatly improved. In answer to comments upon the question of how teachers colleges could better serve their fields, 209 out of 245 superintendents, indicated a follow-up service as a means of improvement.[15] The school system as well will profit from a follow-up system by the suggestions rendered to it from supervision specialists in the field. The value of the good that comes back

[12] E. G. Bathhurst, *Teachers College Follow-Up Service*, p. 5. New York: Teachers College, Columbia University, 1931.

[13] *Ibid.*, p. 8.

[14] R. W. Fairchild, "Field Contacts as Sources for the Improvement of Teacher Education," *Educational Trends*, 1-2 (May, 1933) 23.

[15] *Ibid.*, p. 21.

to the college cannot be too greatly emphasized. Through the visitation surveys of the public school systems, the needs of the systems will be noted and the curriculum revised in the light of this information. In a study[16] of 70 teacher-training institutions 61 per cent of the superintendents employing graduates felt that inadequate consideration was given to teacher preparation to meet the needs in the field. Information such as this focuses the attention on the needs of the curriculum, and the curriculum can only be effectively revised in the light of the data assembled from this work.

The follow-up service is primarily designed for assistance to the graduate. A rating card and the personal report of the inspecting director are the basis for promotion as reported by Bathhurst.[17] In case a student loses his job, the placement services are open to him to use. This practice is followed by Wellesley and Teachers College. In regard to the betterment of positions, the candidate is kept in mind, and if she is the best qualified candidate for the position, she is nominated by the bureau. This practice is followed by Teachers College also. Through a phase of this follow-up work, e.g., the securing of information for revision of the curriculum, the student will become better equipped to meet the definite needs of the field. In addition the superintendent will be satisfied and the reputation of the institution will be secure.

The following study[18] presents procedures followed for three phases of a follow-up service in a college. The first phase is concerned with assistance to the graduate, the second, related to follow-up training of students, and the third interested in the placement of students.

I. In developing a program for helping graduates adjust their training to their first teaching difficulties, the writer introduced five activities:

A. College instructors to visit and analyze their problems in adapting working situations.

B. Extension division provided printed and mimeographed bulletins containing suggestions in the field.

C. Correspondence carried on with graduates. Instructors encouraged to follow visits with letters.

D. Questionnaire studies of graduates' own opinions of their difficulties were made.

E. Reports of visits were studied and assistance given to teaching graduates.[19]

II. Relating follow-up to training of students

A. Analyzed and studied needs of teaching graduates based on instructors' reports.

B. Studied instructors' reports for improving curriculum.

C. Asked graduates to report on teaching difficulties.

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[16] *Ibid.*, p. 21.

[17] E. G. Bathhurst, *Op. Cit.*, p. 34.

[18] *Ibid.*, pp. 2-3.

[19] *Ibid.*, pp. 1-2.

D. College Courses—teachers' difficulties reported by South Dakota County Superintendent.

III. Placement

A. Information regarding social and living conditions.

B. Instructors filed ratings of graduates' teaching.

III. THE GUIDANCE PROGRAM

Separate and apart from the placement and follow-up service is the need, in my opinion, of a guidance program, sponsored by each respective department training teachers. In the study[20] reported by Adams, "All forms of student personnel are coordinated into a central office. Teacher placement is regarded as one function of student placement." In addition, he reports, "Only 4.7 per cent faculty members make placements independent of placement offices." These conclusions seem to indicate that little follow-up service of a personal nature is carried on independently by departments. The normal school, set up for teacher-training in only one field, is best qualified to carry on this work, because of the intimate contact between the bureau and the school.

Duplicate forms of a student's qualifications and positions are generally filed in the major department, but other than this procedure little is done to establish a personal contact between the department and the student teacher.

The distinction between the guidance and the follow-up is that each respective major department should establish a consultation bureau designed to give an intimate and personal service to its graduates. The follow-up service is purely a professional, technical matter, whereas the guidance program of teachers in service is a more intimate and personal procedure. Specifically applied, each department of physical education may establish its bureau and elect approximately three members to the board. The chairman of the board could well be the senior critic teacher of student teaching. It would be the committee's task to establish contact with the graduates of their school and to become interested in each teacher and situation. Emphasis should be placed on contacting the new graduate, although the older graduate should receive the benefits of this service as well.

The end to be achieved from such procedures would be that of the establishment of a personal bond between the college department and the student. In this manner the student would feel free to communicate with the committee on personal matters relative to certain social conditions; matters pertaining to professional conduct with his superior; and matters pertaining to his future plans. The benefits that would accrue from such a relationship would greatly balance the work involved. In this manner, the graduate would be encouraged to do his or her best work. He would be encouraged to perhaps pursue some definite piece of re-

[20] W. H. Adams, *Op. Cit.*, pp. 76-93.

search or to submit various articles to professional magazines. This bureau may serve as an encouraging factor to new students who hesitate to come forward because of their inexperience. It might also be the task of this committee to appoint its promising graduates to lead discussions at physical education conventions. It may also be influential in securing his appointment to a committee. In these ways, the graduate becomes known, and thus new channels of growth are opened to him. Closely allied with the follow-up service, therefore, is the guidance program.

A second phase of the bureau's work is to encourage the graduates to subscribe to the leading literature in the field. The *Journal of Health and Physical Education* and the RESEARCH QUARTERLY should be a part of every graduate's library. In addition special magazines, such as *The Sportswoman* for women will enrich their knowledge of the field of sport. Articles of particular interest should be pointed out in other magazines. As this consultation service continues, each teacher's interest may be noted and particular reference made to articles that will increase her knowledge in that subject. The criticism that it is up to the student to know and be responsible for current literature is well taken, but at the same time the re-emphasis for a young teacher is important.

The matter of joining professional societies should be encouraged. Each student should become allied with the American Physical Education Association. All teachers should be encouraged to attend conventions and conferences whenever possible. They should attempt to attend the national and sectional conventions as often as possible.

The woman teacher should join her own alumnae physical education group. (The remaining societies refer only to women.) She should be encouraged to acquaint herself with the National Amateur Athletic Federation policies, even though joining may depend on her own convictions relating to the matter of interscholastic competition. She should be encouraged to become an allied member of the National Field Hockey Association or other similar organizations that are attempting to set up standards for the betterment of specific sports. She should be familiar with the Constitution of the Athletic Conference of American College Women, the Women's Athletic Association, and the Girls' Athletic Association. The advisability for her joining each of these organizations depends on her own situation. At least this is a guidance measure designed to help her derive the rich experience that comes from being a participating member in such organizations.

The bureau should encourage her to pursue graduate training if she shows reasonable promise in the field. Perhaps in some cases it may be more advisable for the committee to advise her to pursue a Master's in education, rather than in physical education. The nature of her undergraduate training, the type of experience, the post she hopes to fill, and the capacities will all be determining factors in her selection. However, if she wishes to continue teaching in physical education, and is reasonably

successful, she should be encouraged by this same board to pursue graduate training. The various graduate schools' policies and courses should be investigated and evaluated, and advice from the committee may be given to her in the light of their knowledge, gained from the guidance program, of her interests, capacities, and personality.

To conclude, it should be definitely stated that placement, follow-up, and guidance are three integrated factors determining in no small measure the success of the graduating teacher today.

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An Investigation of the Influence of Exercise Upon Digestion in the Stomach

The Effect of Swimming upon the Acidity of the Gastric Juice

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MUCH popular interest has been attached to the general problem of swimming in its time relationship to the ingestion of meals. There is incriminating lay belief that participation in this type of exercise immediately after a full meal predisposes to swimming accidents. During the process of digestion, splanchnic vasodilatation occurs and blood is diverted away from inactive regions. Similarly when generalized muscular work is performed, it is believed that splanchnic vasoconstriction shunts blood away from the visceral area so that the volume flow might increase in the active skeletal muscles and in the skin. The simultaneous performance of digestive and muscular work may therefore impair the efficiency of performance in one or both of these fields and may conceivably lead to secondary effects which endanger the life of the swimmer. We have already demonstrated that various types of severe laboratory exercise may at first induce profound changes in gastric secretory and motor function (Hellebrandt *et al.*, 1934) and have likewise made a limited series of observations upon the influence of participation in a competitive sport (Hellebrandt and Miles, 1932). The primary object of this experiment was to extend the observations on the effect of a natural sport activity upon the efficiency of the secretory power of the stomach, when that activity is indulged in as if for healthful exercise and pleasurable recreation. Incidental data were also obtained to discover whether the ingestion of a meal affects the onset of fatigue and the efficiency of performance when the exercise occurs at varying intervals after it.

PROCEDURE

Eighteen healthy young women without evidence of gastro-intestinal disease acted as subjects for this investigation. The majority of them were upperclass university students. All but one had professional training

in physical education, and they were accustomed to strenuous muscular activity. They represent a range of swimming ability from fair to excellent. As a group they had more than average proficiency; one half of them were expert performers and members of a swimming club. They were well trained in laboratory science and as a whole were familiar with the techniques of physiological research. They made unusually intelligent and cooperative subjects. Several were experienced tube swallowers who had many times acted as subjects for gastric research. Before presenting themselves for the first experiment, each novice was taught how to swallow the stomach tube and was given an opportunity to swim with it in situ. The Rehfuss tube is well tolerated by most persons and produces relatively little discomfort. It was found possible to swim with it in the stomach; the end coming from the mouth was clamped and so fastened to the bathing suit that it was little disturbed by the stroking.

At the pre-experimental try-out each subject was observed by two Red Cross Life Savers who advised in the selection of a bout of exercise adjusted to the skill of the doer. The exercise was to be of very moderate severity, giving a good but not strenuous work-out. It was necessary to standardize it so that approximately the same muscular work be performed under the varying conditions of the experiment. A combination of two strokes was selected. The more skilled alternated between various combinations of the crawl and the side stroke in definite sequence, with a specified number of lengths' swim for each stroke; the less proficient swam the side and the elementary back stroke. To pace the exercise, it was executed to music, a popular melody in ¾ time being played on a phonograph at a tempo which suited the majority. The subjects endeavored to maintain the same timing throughout the entire experiment and to accent each stroke in coincidence with the beat of the music. The number of strokes made to swim the first length of the pool in each alternation of strokes was counted and recorded. This score was used as a check upon the constancy of the rate of working. It was also used for the detection of fatigue upon the assumption that the onset of tiredness causes an increase in the number of strokes necessary to traverse a given distance provided the rate of stroking is constant. The human machine puts forth less powerful effort when fatigued and disregards the efficient swimming position in consequence of which there is an increase in resistance and less useful work accomplished per stroke. The exercise was continuous and lasted from 13 to 14 minutes. Pool and room temperatures were relatively constant, varying between 27–28°C. and 24.4–26.6°C., respectively.

On the morning of the experiment the subject ate her usual breakfast, avoiding only the ingestion of meat. Luncheon was omitted and in its place the subject was given 200 cc. of strained orange juice sweetened with a teaspoon of sugar, this "meal" having a food value roughly of 350 calories. No food or fluid was taken after the noon hour. The experiment

could not be performed until late in the day and the above régime was instituted because it was deemed inadvisable to withhold food entirely since the majority of the subjects were engaged in the moderately strenuous routine of the professional physical education student. Approximately five hours after the imbibition of the orange juice the experiment commenced.

The Rehfuss tube was swallowed until its tip reached the most dependent pole of the stomach and remained in place to the end of the experiment. The total contents of the stomach were aspirated and a test meal of 400 cc. of warm thin oatmeal gruel, salted to taste, was administered. This is a palatable meal enjoyed by most hungry subjects. It was swallowed with the tube in situ, being introduced into the stomach in 5 minutes. Ten cubic centimeter samples of the gastric contents were aspirated every 15 minutes over a period of 2 hours. Before removing a sample the gastric contents were thoroughly mixed by withdrawing and re-introducing the chyme with a syringe. After the sample was obtained the tube was cleared of the gastric juice and gruel with 10 cc. of air which forced the tube contents back into the stomach. Saliva was expectorated constantly to avoid dilution and neutralization of the gastric contents. To detect duodenal regurgitation, note was made of the presence of bile in the aspirated samples. These were titrated with N/10 or N/100 NaOH using dimethylaminoazobenzene and phenolphthalein for the determination of free and total acidity respectively. Results are reported in terms of the number of cubic centimeters of N/10 NaOH necessary to neutralize 100 cc. of gastric juice. The end of the digestive cycle was detected by the disappearance of starch. The subjects sat quietly reading or writing in the experiment room throughout all but the swimming procedure.

Each subject reported for a minimum of five experiments. On two of these occasions the normal resting acidity response of the stomach to oatmeal gruel was determined. On the other three the subject swam fifteen, thirty, and sixty minutes after the ingestion of the meal. The laboratory was situated close to the pool and in the same building with it so that no unusual conditions were introduced in transit. The subject entered the poolroom from three to five minutes before the pre-exercise sample of gastric juice was taken. She rested quietly until it was time to aspirate. Immediately after, the subject entered the pool and began swimming. She was instructed to avoid swallowing water and to expectorate as necessary into the troughs at the pool ends. The exercise continued until one minute before the next sample was to be taken. It was aspirated and the subject then returned to the laboratory.

It is fully appreciated that the influence of swimming upon the digestion of 400 cubic centimeters of oatmeal gruel may not be analogous to its effect upon the behavior of the stomach when confronted with the task of altering the consistency and chemical composition of a mixed meal. Yet the trend of any change should be similar. The function of the stom-

ach is to triturate the foodstuffs presented and to secrete a gastric juice of an acidity in consonance with the optimal activity of its enzymes. Different substances stimulate it to characteristic degrees of activity. It is reasonable to suppose that a procedure which depresses the motor and secretory response of the stomach to a test meal will also depress its response to the stimulus of an every-day dinner. The oatmeal gruel meal of Boas was selected because its volume produces a distinct feeling of fullness much like that of an ordinary heavy meal, which is not true when the alcohol or tea and toast meals are taken.

A limited study, however, was made of the influence of the exercise of swimming upon the digestion of a dinner consisting of doubly ground fried beef steak seasoned with catsup, buttered mashed potatoes, carrots and peas, a slice of bread and butter, pear sauce, a glass of whole milk and vanilla ice cream. The approximate food value of this meal was 1400 calories. Fractional analysis with continuous intubation cannot be performed comfortably with anything but a small tube, like the duodenal tube devised by Rehfuss. It was found that even with the most careful preparation of the food and the most asiduous mastication, the gastric contents could not be successfully aspirated until 60 to 90 minutes after digestive activity had commenced. Even then, it was frequently necessary to remove the tube for the purpose of freeing food residues impacted between the slits of the metal olive, thus blocking the passage of semiliquid contents. The procedure was similar to the oatmeal gruel experiments, except that the swimming consisted of free play over a period of one-half hour immediately following the meal, and that samples were withdrawn at 15-minute intervals for a total of 240 minutes between the end of the first and fifth hours after the beginning of its ingestion. It was necessary to centrifugalize these samples before titration.

RESULTS AND THEIR INTERPRETATION

The results of this study are based upon free and total acidity determinations of 1069 gastric juice samples. Ninety-four fractional analyses were made on 18 different subjects after a test meal of oatmeal gruel. In addition 16 protracted fractional analyses, in themselves yielding 262 gastric samples, were made upon 6 different subjects following the digestive response to a mixed meal. Five subjects of this later group also performed the whole of the oatmeal gruel series. The acidity determinations representing each digestive cycle were graphed. The curves were individually studied and classified. Of the 18 subjects in the oatmeal gruel series, 10 showed a normal response to this gastric simulant by comparison with the findings of Bennett and Ryle (1924). Of the others, one was discarded because of extreme irregularity and variability in the secretory response. For the remaining 7, hypoacidity characterized the curves of 3, and in 4 there was total absence of free HCl in at least 1 of the 5 cycles comprising the experimental procedure. There is no evidence

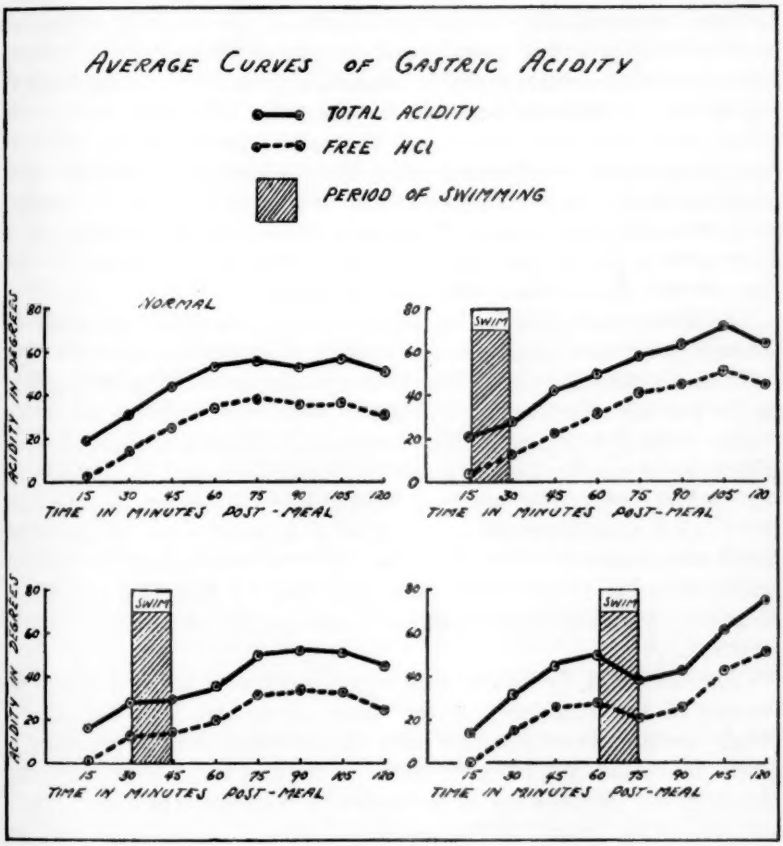
that the feeding régime on the day of the experiment in any way distorted our findings. Food residues were never observed in the contents of the stomach when the subject presented herself. The average volume of the residuum was 37 cc., the mean free and total acidity being 16 and 33 respectively. This compares favorably with the contents of the normal fasting stomach, 10–50 cc. of secretion being usually obtained with an average total acidity of 30 and free acidity of 18 (Stevens, 1931).

The secretory response of the stomach is readily influenced by nervous, chemical, and hormonal factors difficult to control. There is in consequence relatively great variation in the gastric acidity when individual samples are compared, unless a powerful gastric stimulant like ergamine acid phosphate is administered subcutaneously or intravenously. Under such circumstances a much greater uniformity of response is attained. The use of ergamine would have defeated one of the important conditions of this experiment; that is, that the meal be as normal as compatible with good experimental procedure. However, Bell and MacAdam (1924) have shown, and the observation has since been confirmed by others, that the general trend of the response to repeated meals of gruel is highly constant. The data do not lend themselves to detailed statistical handling. The individual curves were therefore superimposed and their trends compared and recorded. The average curves of fifty experiments performed on the ten normal subjects are presented in Graph 1 as an illustration of the general character of the results of this inquiry.

Perhaps the most striking finding was the disregard with which the stomach went about its normal work in spite of the performance of muscular exercise during the course of the digestive cycle. This was not wholly unexpected. We had been observing in the laboratory that an exercise at first profoundly depressing might eventually have no effect upon the digestive work of the stomach (Hellebrandt, Baernstein, and Hoopes, 1934). We were beginning to suspect that this organ may have a large functional margin of safety and that once our experimental animal became accustomed to the peculiarly severe bout of exercise prescribed, it could perform very strenuous muscular work without interference in the secretory and motor tasks of its stomach. The exercise introduced in this experiment was a natural and pleasant one, unassociated with emotional stress or discomfort. An analysis of the data shows that the following phenomena occurred with sufficient frequency to be significant: (1) great similarity between the normal and exercise curves in the individual series and within the groups as classified; (2) a tendency toward moderate terminal augmentation in the secretory response when exercise was associated with the digestion of the meal; (3) a mild and transitory lowering of the normal acidity rise during and immediately after the periods of swimming.

The similarity in the trend of the normal and exercise acidity responses justified the calculation of an average series of curves to represent

the tendency of each group. The terminal augmentation seems to be a genuine secretory stimulation. It appeared when the swimming followed the meal by fifteen and sixty minutes in the curves illustrated. It was likewise observed when the exercise succeeded the meal by an half hour in the hypoacidity and anacidity groups of subjects. On the other hand,



GRAPH 1

the lowering of the acidity during and immediately after the swimming may be an artefact. As demonstrated in the curves of Graph 1, it is least evident when the swimming was indulged in fifteen minutes after the ingestion of the gruel, still slight when it occurred in one-half hour, and most marked when the subject swam one hour after eating. It was almost universally present. There was a plateau of an actual reversal of the curve in two-thirds of the cases when the subject swam one hour after eating.

Our previous experiments have shown that when a large semi-liquid meal is introduced, the stomach at first empties itself rapidly, as much as 70 per cent of its contents being evacuated during the first hour (Hellebrandt and Tepper, 1934). Although the subjects were cautioned to guard against swallowing water and saliva, there is little doubt that some contamination of the gastric contents with these diluents inadvertently occurred. The natural movements of the head in swimming coupled with the action of eddies and currents on the tube floating from the mouth of the subject probably resulted in some degree of mechanical stimulation of salivary secretion by the tube. The free passage of chlorinated water into and out of the mouth incidental to the oral breathing peculiar to swimming might likewise have augmented the flow of saliva. Gulps of water are occasionally swallowed by the best of swimmers. Assuming that water and saliva enter the stomach, the effect of a given amount of contamination upon the acidity of the contents within that viscus is greater the smaller its fluid volume.

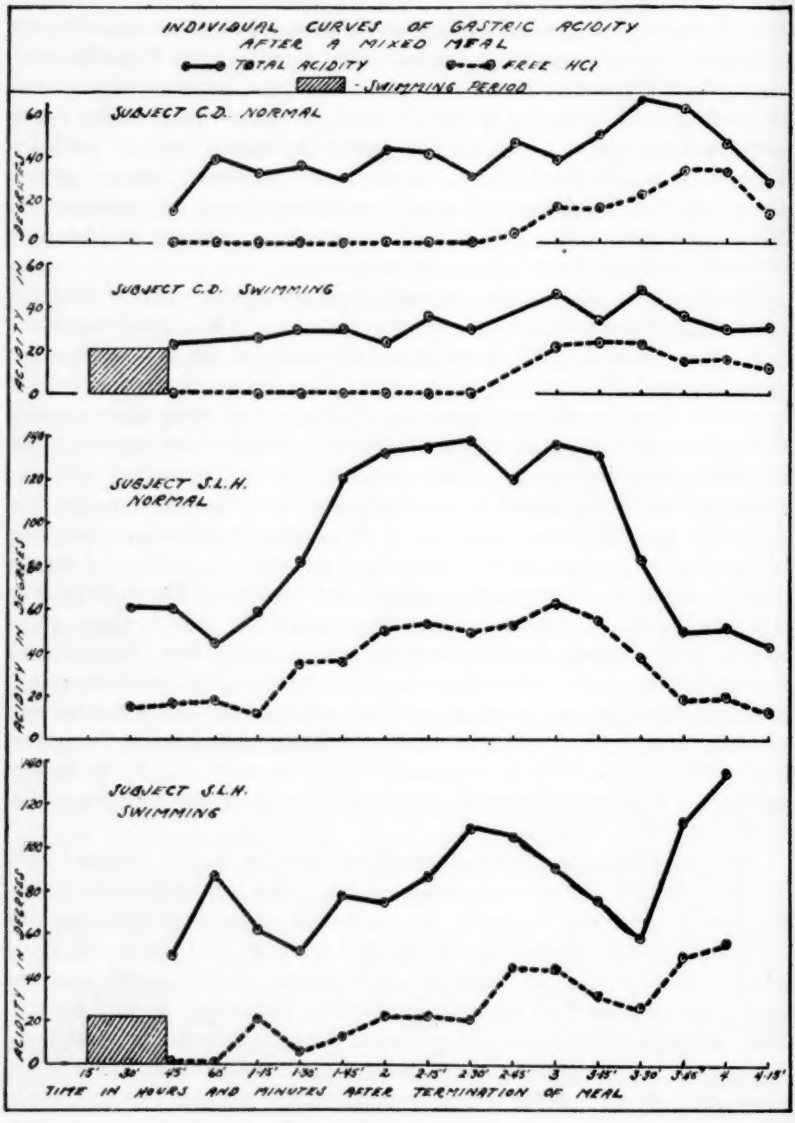
To demonstrate this finding experimentally, standard test meals of oatmeal gruel were taken and the subject swallowed saliva and a few cubic centimeters of water during fifteen-minute intervals corresponding to the periods of swimming. Saliva was expectorated during all other phases of the digestive cycle. Mixed samples of the gastric contents were withdrawn at quarter-hour intervals and titrated as usual. A lowering of the normal acidity rise occurred during the swallowing periods, the effect being more pronounced the later it occurred after eating. The above evidences lead us to the belief that the lowering of the gastric acidity during and immediately after swimming is a deception secondary to neutralization and dilution and not a true exercise inhibition of gastric secretion.

The results of the mixed meal experiments were hard to interpret because of the irregularity of the curves of acidity. It is difficult to obtain smooth secretory curves after the introduction of so complex a gastric stimulant. According to the views of Ivy (1925) there are three phases in the development of the secretory response. The sight, smell, and taste of food stimulate the psychic secretion of gastric juice early in the cycle. This is called the cephalic phase. Mechanical stimulation of the gastric mucosa may have a further effect, minimal in our experiments because the food was so thoroughly cooked, mashed, and masticated. During the gastric phase, stimulation is continued chemically by the presence of secretagogues in the gastric contents or of hormones produced by them. Finally, chemical constituents in the chyme affect the intestinal mucosa when they are ejected into the duodenum, and in their turn humoral influences originating in the gut augment the gastric secretion. It is evident that in a situation where so many mechanisms may influence the glandular response, variations in the physical and

mental condition of the subject and the exact composition of the meal may combine to alter the acidity of the juice aspirated from time to time during a given cycle. It is impossible to standardize accurately such a stimulant. It contaminates the aspirated samples with insoluble residues. Food fragments block the tube. The tube must remain in the stomach from four to six hours. In fact, the mixed meal defies every important criteria of a satisfactory gastric functional test set forth by Bloomfield and Polland (1933). It was used, however, because of the frequency with which we were asked how the exercise of swimming would affect the digestion of a full meal of carbohydrate, protein, and fat presented in palatable form and normal proportions.

Realizing the limitations of the mixed meal procedure, four of the most uniform acidity curves are presented in Graph 2. The curves of subject C.D. were obtained in the morning and afternoon of the same day, those of subject S.L.H. on consecutive days. The former show an obvious similarity; both, moderate depression. Of the sixteen observations made, in no case were great deviations from the normal trend evident. The exercise acidity curves were either similar to the resting normal observations, or slightly depressed. It is to be remembered that the exercise was somewhat more strenuous than that of the oatmeal gruel series, consisting of free play for one-half hour. The subjects swam, dove, and played simple games such as tag, keep-away, baseball, and volleyball. The activity was not continuous, but, being occasionally competitive, was at times quite severe. This accounts for the tendency toward depression. No terminal augmentation similar to the slight one of the oatmeal gruel series occurred. This may have been unnoted because in most cases the stomach tube was removed before food residues had completely disappeared from the aspirated samples. Such an augmentation is, however, hardly to be expected in a digestive cycle which terminates five or six hours after exercise ceases.

The concentration of the hydrochloric acid in freshly secreted and uncontaminated gastric juice is remarkably constant. Upon stimulation its rate of secretion increases. In the course of normal digestion the acidity is quickly reduced by combination with the proteins in the food, and by dilution and neutralization with saliva, gastric mucus, and regurgitated alkaline fluid from the duodenum. This varies around 0.2 per cent, although after fractional analyses, titrometric acidities as high as 0.36 per cent are met with in perfectly normal individuals. There is an optimum acidity for peptic digestion and concentrations above and below this are less advantageous. Stevens (1931) presents 0.15 to 0.2 per cent as the most favorable. The peak total titratable acidity in the normal curve of Graph 1 is 0.208 per cent HCl. The average terminal augmentation which occurred when exercise was participated in one hour after the meal elevated this acidity only to 0.273 and the inhibition of the peak when exercise followed the meal by one-half hour reduced it to 0.189 per


INDIVIDUAL CURVES OF GASTRIC ACIDITY
AFTER A MIXED MEAL
TOTAL ACIDITY
FREE HCl
SWIMMING PERIOD
SUBJECT C.D. NORMAL
SUBJECT C.D. SWIMMING
SUBJECT S.L.H. NORMAL
SUBJECT S.L.H. SWIMMING
ACIDITY IN DEGREES
0
20
40
60
80
100
120
140
15' 30' 45' 60' 1-15' 1-30' 1-45' 2 2-15' 2-30' 2-45' 3 3-15' 3-30' 3-45' 4 4-15'
TIME IN HOURS AND MINUTES AFTER TERMINATION OF MEAL

GRAPH 2

cent. These variations fall well between the optimal limits. In so far as the digestive power of the essential enzymes of the secretion of the stomach is dependent upon the acid of the medium in which they reside, and this is unaffected by the experimental procedure, it may be concluded that the exercise of swimming as administered in no way modifies the functional secretory capacity of that organ.

In only one case did the swimming efficiency of the subject increase consistently with the lengthening in time between the ingestion of the meal and the exercise. Swimming fifteen minutes after the meal was harder than swimming one hour after the meal in nine of seventeen instances. Swimming one-half hour after the meal is not necessarily more difficult than exercise one hour after. The stomach empties rapidly at the beginning of the cycle and then more slowly so that the relative volume of its contents at these two times might not be much different. It is possible that a full stomach might impair pulmonary ventilation and thus "hurt the wind" and affect swimming performance. Clear-cut evidence of such effect is, however, entirely wanting. The activity was too mild and the subjects too fit neuro-muscularly to expect any great evidences of training. Where one might expect it, in the records of the six subjects who were rated poorest in swimming ability, the decrease in strokes indicating an increase in efficiency does not once occur. As a whole there was only slight change in the number of strokes necessary to swim a pool length. It is of interest to note that the subjective reaction to the exercise procedure was universally good. Irrespective of the time when the subject swam after the meal, she invariably reported that she felt better for having exercised.

SUMMARY AND CONCLUSIONS

The effect of swimming upon the efficiency of the secretory power of the stomach has been studied in 18 young adult women when that activity is participated in 15, 30, and 60 minutes after the onset of the digestive cycle. The functional capacity of the stomach was measured by its acidity response to a Boas test meal of oatmeal gruel and to a 1400 calorie mixed meal of meat, potatoes, vegetables, bread and butter, milk, and dessert. Incidental data were obtained to note whether swimming at various intervals after a meal affects the onset of fatigue and the efficiency of performance. The experimental evidence suggests the following:

1. Fifteen minutes of continuous swimming, during the digestion of oatmeal gruel, moderately stimulates gastric secretion in the terminal phases of the digestive cycle.

2. One-half hour of free play in the water after a full 1400-calorie dinner is without effect or moderately depresses the acidity response.

3. There is no evidence that the swimming, as administered after a gruel meal, affects the onset of fatigue or the efficiency of performance.

4. We conclude that the simultaneous performance of digestive and

muscular work as administered in this experiment does not markedly affect the efficiency of either.

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Toward a "Code" for Physical Education Teachers

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INTRODUCTION

REVERBERATIONS of the various industrial codes under the N.R.A. will be heard in the field of education. Classified correctly, under the President's Re-employment Agreement or Blanket Code, as a profession, the teacher, the teaching profession, and education in general have received little attention in the program of National Recovery.

Spontaneous efforts by various groups for student loans, school building programs, maintenance of normal budgets, faculties, salaries, and curricula have not developed to such an extent that they are national in spirit or in scope. Revision of curricula will probably be felt in many school systems and with such revision the problem of teacher load should be fairly and thoroughly investigated.

When the industrial codes were being formed, probably a great number of teachers asked the questions "Why isn't there a code for education?" or "Why isn't there a code for school teachers?" The answer lies in the fact that the code can come from either of two places. Either from above—from national organizations controlling educational thought and trends; or from below—from within the teaching profession itself. Probably cooperative efforts and decisions from both groups will be needed in order to stabilize the teaching load as efforts are being made to stabilize labor production, consumption, and the monetary system.

At the beginning it should be understood that the purpose of an investigation into the problem of teacher load should be to enhance teaching; to organize, divide, and regulate the teaching load, and each teacher's load, in order that his or her teaching will be done more efficiently and effectively. The purpose of such an investigation is not necessarily to show that one department or one subject or one teacher is being overworked. In conjunction with such an investigation, a review of aims and objectives should go hand in hand. A great deal of teaching and time is probably being spent upon materials and in procedures which cannot be educationally justified, which are not educational "essentials," and which will not pay "dividends" either in school life or in after-school life.

The equal distribution of the teaching load is an important problem

for the supervisor, director, or administrator of the physical education program. The manner in which his department and program functions will depend a great deal upon his solution of this problem. His insight into aims, objectives, individual training, abilities, likes, and dislikes often means the difference between a smoothly functioning, enthusiastic department and an irritable, unenthusiastic group of teachers.

Two groups should be definitely affected by an investigation into the problem of teacher load and an application of the results of the investigation to the teaching personnel. The first group of teachers usually thought of is the "overworking" group—those individuals carrying a heavy teacher load, based upon the pupil-hour unit of measuring, and who supplement this work with the responsibilities of extra-curricular activities, community work, curriculum construction, parent-teacher associations, supervision of student clubs and functions, and assisting in the study of professional problems. Some uniform and fair method of determining the actual classroom, gymnasium, or playfield load in relation to the extra duties for these individuals should be developed.

The other group needing such an investigation is the "under-working" group—those individuals under whose supervision false objectives or standards have been developed, or undue emphasis has been placed upon subjects or activities which do not pay dividends or produce proper results in school life or after-school life. This group may actually put in as many hours as the over-working group, but because of ignorance of educational and professional objectives, their efforts are not so effective. In this sense they "under-work." We come back to the basic problem of aims, objectives, and policies. What is the task of the teachers of each school subject and where should the emphasis be placed?

COMPARING THE TEACHING OF PHYSICAL EDUCATION WITH THE TEACHING OF OTHER SCHOOL SUBJECTS

Upon a basis of the pupil-hour method of computing the teacher load, studies have shown that that of the teacher of physical education, in all sections of the country, exceeds all other teachers.[1]

The average pupil-hour loads per week of the various school subjects as given by Almack and Lang are: English, 609; language 554; history, 628; mathematics, 620; science, 568; music, 713; shop, 463; domestic art, 444; and physical training, 968.

The pupil-hour criterion of teacher load does not, however, give a complete picture of the total work done by the teacher. It leaves out all duties outside of the actual classroom. This point is important because much of the physical education program is extra-curricular or extra-class in nature.

The pupil-hour criterion, also, does not take into account the fact that

[1] J. C. Almack, and A. R. Lang, *Problems of the Teaching Profession*, p. 198. New York: Houghton Mifflin Co., 1925.

some subjects are more difficult to teach than others. From the above figures upon pupil-hour loads it seems that administrators believe that physical education is an easy subject to teach because of the heavier pupil-hour load which teachers of physical education carry. This belief of administrators is also shown by the manner in which they scored the various school subjects in an investigation by Almack and Bursch.[2]

An analysis of the material presented shows that the average administrator fails to recognize the teachers' viewpoint as to the relative difficulty of teaching physical education. They indicated that they believed that physical education was only 46 per cent as difficult to teach as English composition, and that it was only 1 per cent more difficult than taking care of the study hall! They indicated they believed athletics more difficult to teach than general physical education classes by 12 per cent. This depends, of course, upon the grade of teaching in the physical education classes and upon the coaching on athletic fields. Further study must be made to prove this point.

It is interesting to compare the teachers' estimate of difficulty with that of the administrators. The teachers believed that physical education was almost twice as hard to teach as did the administrators. The administrators scored physical education 46 per cent while the teachers scored it 83 per cent. The teachers indicated they believed athletics are equal to English composition in teaching difficulty.

Clearly one of the problems of equalizing the teacher load in physical education with respect to the other school subjects is to educate the administrators as to the difficulty of teaching physical education activities.

THE RISE OF EXTRA-CURRICULAR ACTIVITIES

The problem of standardizing the teaching load, both in education and in physical education, has been increased in late years because of the increasing amount and number of the extra-class and extra-curricular activities. No one has been able to determine the relative difficulty of supervising these extra activities and teaching general academic activities. As a consequence very seldom are they included or thought of as an important part of a teacher's load.

The wide range of these activities is shown by Jordan in his chart for classifying extra-curricular activities.[3] The prominent place of athletic and intramural sports, as well as other physical education activities, in the extra-class and extra-curricular program has been shown in many surveys:

"Student organizations devoted to athletics, music, forensics, and dramatics occupy a prominent position in the American secondary school. In a recent survey by the writer of more than 1,000 activities in 82 urban junior high schools, it was

[2] J. C. Almack, and J. F. Bursch, *The Administration of Consolidated and Village Schools*, pp. 88-89. New York: Houghton Mifflin Co., 1925.

[3] R. H. Jordan, *Extra-Classroom Activities*, p. 18. New York: T. Y. Crowell Co., 1928.

found that 29 per cent of the organizations were engaged in athletics, 22 per cent in music, and 15 per cent in dramatics and forensics. The exceptional popularity of these interests with high school students was forcefully expressed by 260 girls in the Horace Mann School of Teachers College, whom Sturtevant and Flaming asked to name the activity which they enjoyed most and that from which they obtained the greatest benefit. Of these girls, 55 per cent described athletics and 26 per cent literary and musical activities as most attractive, and 49 per cent felt that these were most beneficial."[4]

Further evidence of the amount of time given to the supervision of extra-curricular activities is shown by Nash[5] in his diagnosis of a report of the Committee of Fifteen High School Teachers' Association, California, 1923. He says, "It should be noted . . . that while the director of physical education is carrying a full teaching load in the classroom he has the largest percentage of assignments to other duties and by far the largest to extra-curricular activities."

Examination of the report shows that the physical education teacher spends over twice the amount of time in the supervision of extra-curricular activities as does the average teacher (15.5 and 7.5).

The report also shows the physical education teacher is assigned a greater number of duties than is any other teacher in the school. Because of his intimate contacts with the boys, and of the woman physical education teacher with the girls, the teacher of physical education is in an admirable position to perform these assigned duties. He is, however, often overburdened with these assigned duties. The teaching load should not vary much from day to day through the assignment of unexpected tasks.

PARTICIPATION OF TEACHERS IN THE SUPERVISION OF EXTRA-CURRICULAR ACTIVITIES

The supervision of these extra-class and curricular programs has often been left to the initiative and personal interest of the individual teachers. When these activities have become so firmly established in the school curriculum, however, that they should not be called "extra-curricular" but should be thought of as a definite part, and an important part, of the school program, some method should be used to lessen the classroom teaching load of those teachers interested in them.

The advisory load for extra-classroom activities is unequally distributed. Less than half of the teachers participate in the supervisory work of the school program. Figures presented by Professor Joseph Roemer show that in the North Central Association of Colleges and Secondary Schools, 34.6 per cent of high school teachers devote some time to extra-curricular activities. In the Association of Colleges and Secondary Schools of the Southern States, 43.6 per cent of teachers participate in these duties![6]

[4] Paul W. Terry, *Supervising Extra-Curricular Activities*, p. 215. New York: McGraw-Hill Co., 1930.

[5] J. B. Nash, *The Administration of Physical Education*, p. 342. New York: A. S. Barnes & Co., 1932.

[6] R. H. Jordan, *Op. Cit.*, p. 28.

Davis' report[7] of the schools of the North Central Association shows that:

"Of 68.8 teachers replying, 44 per cent spent no time whatever in duties of this sort, while 33 per cent were called on to give less than 30 minutes per day. Obviously, therefore, with 77 per cent doing little, either 23 per cent of the teachers were doing much or the tasks were not performed. As a matter of fact, the returns show that 6 per cent of the teachers were asked to spend more than 1 hour per day in duties of this kind ..... The teachers of certain departments seem to be called on for an excessive amount of such labor. Here, doubtless, is the heart of the trouble—the extra-curricular duties are not properly distributed, or a sufficient allotment of the regular school time of the teachers is not made for them."

A large portion of this supervisory work is being carried by the teachers of physical education on every educational level.

THE INTENSIVE TYPE OF WORK REQUIRED IN SUPERVISING EXTRA-CURRICULAR PHYSICAL EDUCATION ACTIVITIES

Supervision of extra-curricular activities varies from mere casual oversight in the case of certain clubs or groups, such as the checker club, chess club, hiking club, social fraternities and sororities, etc., to a careful and systematic piece of instructional work, taxing the time and energies of the teacher to the utmost, as is the case in athletics, music, dramatics, and forensics.

Jordan[8] says:

"For the regulation regarding conduct of athletics or dramatics will necessarily be more complete and drastic than those involved in the checker or chess club or the hiking club. In the latter, the presence of the teacher with the club may frequently be dispensed with except for an occasional visit or 'look in'; the initiative of the pupil may be allowed to develop with very little guidance. But in the case of athletics, a very different situation develops, and the instructor must not only be present with the group but must become the coach or director allowing very little initiative to the group—at least until a very much higher status of morale is reached than holds in most American communities today."

Why has the supervision of athletics developed into such an intensive type of teaching? There are several factors which point to the reasons for this development. In the first place, athletics contain intense competitive possibilities. The competitors feel the need for intensive training and coaching in order to perform well and to win. The coach desires success—or to win the contests. There is a certain amount of prestige connected with producing a winning team; to a certain extent each contest is a test of the coach's teaching and administrative ability. Second, in the present set-up in physical education it is to the coach's benefit to produce intelligent, winning teams. Third, any activity which involves large groups must of necessity have a leader who will actively direct the policies of that group. Fourth, any activity which has as its purpose the development of a group of specialists for exhibitional purposes must and will

[7] Paul W. Terry, *Op. Cit.*, p. 348.
[8] R. H. Jordan, *Op. Cit.*, pp. 24, 25.

desire a more intensive type of leadership and instruction. Athletics are, in as full a measure as dramatics, forensics, and music, exhibitional in nature. They are a show, a performance by the most skilled performers of the athletic group. Another reason for the intense work in athletics is the desire to please the public and the immediate superiors in the school.

The supervision of the intramural athletic program is probably not so intensive in nature as are the interscholastic athletics. The strenuous part of this division of physical education, extra-curricular activities, lies in the organization and administration problems. The constant effort on the part of the supervisor of intramural athletics to increase the number of participants, the quality of performance, the number of activities in his program, and to organize an efficient plan of administration for these activities results in an added teacher load of no small amount.

The problem of supervisory work has a direct bearing upon teacher load. The physical education instructor has carried a considerable share of this work. In order to more equally distribute the teaching load surveys must be made in order to evaluate the relative difficulty of supervising the various extra-curricular activities of the school and also within the field of physical education.

TIME SPENT IN SUPERVISING EXTRA-CURRICULAR ACTIVITIES

How much time is spent in supervising extra-curricular activities? Cowling[9] reports that:

"The teacher's median working week is one of 47.5 hours, of which 150 and 107 minutes are spent on 'special school activities' and 'school club meeting' respectively. She finds, moreover, that 71 per cent of the teachers included in her intensive investigation do 2.3 hours of work on Saturday and 50 per cent do 2.2 hours on Sunday. Greenan reports that the average school week of the 53 teachers studied by him is 44.25 hours, not including professional reading; of this time 60 minutes is spent with 'extra-curricular activities.' The 'ideal school week' according to the opinion of this group of teachers should be 40 hours. Davis reports that the average working day of teachers in the schools of the North Central Association is 8.5 hours. Of this 30 minutes is spent in 'assisting in collateral pupil activities.' None of these investigations inquired how much of the time spent with student activities was allowed for on the daily schedule or how much had to be found outside of the regular school day. It is impossible, for this reason, to estimate precisely the extent of the burden which advisory work entails. The main fact, in which all are in close agreement, is that the average teacher works from 45 to 48 hours every 7 days. His working week is as long or longer than that of clerks and skilled laborers. There is a strong tendency to shorten the working week in business and in industry. Farsighted leaders predict that a working week of 5 days of less than 8 hours each will be common in the not far-distant future. The question as to whether teachers should be expected to put in longer hours than do members of less exacting vocations is one that cannot be ignored."

ALLEVIATION OF UNFAVORABLE SUPERVISORY CONDITIONS

The methods generally used to alleviate unfavorable supervisory conditions in physical education have been either to lighten the regular

[9] Paul W. Terry, *Op. Cit.*, pp. 346-347.

teacher load or to give extra compensation. Formerly the latter method was used but recent surveys show school administrative officers are almost unanimous in opposing such compensation.[10]

The practice of reducing the teaching load of members of the faculty who are responsible for large and active organizations and activities is widespread. The most satisfactory steps are those that look to providing the time that is needed during the school day by providing a "special period" in which these extra-curricular activities are carried on and for the supervision of which the teachers are given full teaching credit.

A very helpful provision has been added to the special period plan in the high schools of Pittsburgh, Pennsylvania.[11] "Every school is allowed an 'unassigned teacher' and each school may decide in what manner the time thus available shall be employed. In the Langley Junior High School, for example, it is used to lighten the loads of four teachers who carry heavy advisory burdens. Arrangements such as these, it is clear, go to the root of the trouble and improve the situation immensely." This method, which encourages the placement of more teachers, even if not for full time, would do much to place in positions for which they are trained, many present unemployed teachers, the ranks of which are constantly being swelled by the products of our teacher-training institutions.

In rating teachers and in making recommendations for raises in salary, principals and administrators should not forget the contributions of faithful advisors. Relief from clerical duties is sometimes helpful as is publicly expressed recognition of earnest endeavor. It is desirable, in short, for administrative officers to use every means at their command to show their appreciation of meritorious service in this important work.

EXAMPLES OF STANDARD TEACHER LOADS

Standardizing agencies and authorities in physical education have given us several standard loads.

1. North Central Association of Colleges and Secondary Schools. *For a typical high school*: not to exceed thirty classroom periods a week with the provision that if study hall duty or other supervisory work is included, the recitation is to be diminished accordingly.[12]

2. National Education Association. *For physical education*: 250 pupils per instructor per week, 48 students per class in schools under 1,200 and 60 in schools under 1,500.[13]

3. Department of Superintendence of the National Education Association. *For physical education*: number of pupils per teacher estimated at 250 probably assuming 5 classes daily with approximately 50 students per

[10] J. B. Nash, *Op. Cit.*, p. 343.
[11] Paul W. Terry, *Op. Cit.*, pp. 350-351.
[12] R. H. Jordan, *Op. Cit.*, p. 26.
[13] J. B. Nash, *Op. Cit.*, p. 341.

class. Any plan for teaching loads must take into account assignments after school with intramural or interscholastic athletic teams.[14]

4. White House Conference on Child Health. *For physical education*: twenty-five periods per week and consultation periods, special classes, and after-school play supervision not to call for more than ten additional hours a week, making the total load of the teacher thirty-five periods per week.[15]

5. Subcommittee report, White House Conference. *For physical education*: Total of thirty-five hours per week divided as follows: twenty-five for teaching, five for after-school and Saturday activities, five for rest and administration.[16]

6. Subcommittee Report White House Conference. *For physical education*: total of thirty hours per week divided as follows: twenty-five for teaching, five for rest and administration.[17]

7. J. B. Nash.[18] *For physical education*: has divided the work of the high school physical education teacher into four groups making a possible forty hours per week. His divisions are as follows:

A	Physical Education	I—Low 9	25 to 35 periods per week
	Physical Education	II—High 9	
	Physical Education	III—Low 10	
	Physical Education	IV—High 10	
	Physical Education	V-VI—11	
	Physical Education	VII-VIII—12	
	Physical Education	R—Restricted (physician's excuse)	
		O—Orthopedic	
B	Physical Education	Vacant (rest)	5 periods per week
C	Physical Education	A.S.O. (after-school organization)	5 possible periods per week: may be duplication of pupils, i.e. pupils already enrolled in Group A
	Physical Education	H.P. Health Program Nutrition Program	
	Physical Education	N.O. Noon organization	
D	Physical Education	EX Physical Examination	5 periods possible assignment by principal
		C.P. Consultation Period	
	Other assignment by Principal (Specify type)		
			40 total periods per week

[14] J. F. Williams, and C. L. Brownell, *Health and Physical Education for Public School Administrators*, pp. 54, 55. New York: Bureau of Publications, Teachers College, 1931.

[15] Committee on the School Child, *The School Health Program*, p. 227. White House Conference on Child Health and Protection. New York: The Century Co., 1932.

[16] *Ibid.*, p. 228.

[17] *Ibid.*, p. 228.

[18] J. B. Nash, *Op. Cit.*, p. 339.

The method suggested by Nash takes into consideration that the "consultation period" as well as the "after-school organization" is instructional in nature and gives the teacher who wishes to do these extra-curricular activities a chance to limit his teaching load to twenty-five periods per week, spend five hours in resting, five in organization of extra-curricular activities, and the remaining five in consultation, examinations, or assigned duties by the principal. However, if the teacher does not care to supervise extra-curricular activities, he may spend his complete week's work only in teaching physical education classes.

Nash gives here a cue as to a method which might be applied to any school level for the teaching of physical education and its related activities. Make a list of the duties in physical education on each educational level. Try to evaluate these duties as to relative difficulty of teaching or supervising and then limit the amount of work each teacher should do in that particular field of physical education supervision.

THE PROBLEM IN THE ELEMENTARY SCHOOL

In the elementary school the relation of the teacher to pupil is an intimate one which has traditionally involved the presence of the teacher with the pupils on the playground and after school. The extra-classroom work here is more closely tied up with the regular program of the school, and the grade teacher has ordinarily been held responsible for the entire program.

Under adequate supervision of special supervision and the principal in the non-departmental schools, the room teacher can best direct the activities of the physical education period. This is especially true as the tendency to tie up the activities of physical education with that of the health program increases. Testimony of the efficiency of this plan comes from the states of Virginia, Michigan, California, New Jersey, and others. The plan is more effective where it involves teachers graduated from normal schools in the last decades when physical education has been a recognized phase of training.

Numerous plans have been tried for the supervision of the elementary school playground after 3:15 daily, on Saturdays, and in vacation periods. Under the present organization of the schools, the grade teacher, because of physical limitations, is probably not the one to handle the activities. The strain of a long teaching day is likely to take from her the spontaneity needed for the direction of the playground. It is equally unsatisfactory to employ a playground director who has no connection with the school. This would make a division between play and education. It provides no tie-up between the school and the playground programs.

"The plan of having the elementary teacher stay one hour after school assisted by a playground instructor has proved quite satisfactory. This overlapping provides a point of articulation whereby the whole program is united in a functioning unit. These playground directors can be re-

cruited from colleges and normal schools in the vicinity or they may be teachers awaiting assignments."[19]

The necessity of the elementary teacher being continuously with the children should be compensated to some extent, especially if the teacher is to spend an extra hour in supervising after-school play. A shorter working day, rest periods, "helper teachers," and semi-departmentalization are suggestions for their relief. After a full teaching day, very little should be expected of teachers of the elementary grades after four o'clock in the afternoon.

VALUES OF THE PLATOON SYSTEM AND THE WORK-STUDY-PLAY PLAN

"With the development of the work-study-play idea and the platoon system, specialization has grown up in the elementary grades. With a wise division of responsibilities among the teachers involved in this departmentalization, the extremely heavy load which has caused many teachers of the lower grades to be overworked in their endeavors to meet the multifarious demands of regular work.....will be lightened to a reasonable point."[20]

The platoon system in the elementary school will produce a more equal distribution of supervision as each teacher will then be a specialist and will be expected to supervise those activities related to her field. This will make for a more uniform teaching load as soon as agreement can be reached as to the actual teaching load and to the actual supervisory load.

The problem of supervision of extra-curricular activities must be worked out in each field of education. Some fields are more conducive to such activities than are others. The unifying of these two types of teaching, in each field, will help produce a unified teacher load in all fields of education.

The platoon school system also necessitates an increase in the number of full-time teachers of physical education as was noted in Detroit.

SUPERVISION OF COMMUNITY CENTERS

The recent development of the community centers whose program includes an adult program in physical education and recreation has an effect upon the profession.

The supervision of such centers should make use of the unassigned teachers rather than have a teacher with a full daily program add this to his work; or "where the school community center is organized by the board of education under trained leadership, as in Milwaukee, the teacher load which includes the activities in the evening centers has proved satisfactory. Teachers may be employed full time for such a joint program.[21]

Division of instructors and supervisors into "shifts" from 9 A.M. to 3 P.M., 11 A.M. to 5 P.M., and 2 P.M. to 10 P.M. is also suggested as a method to take care of such a joint program.

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[19] *Ibid.*, pp. 343-344.
[20] R. H. Jordan, *Op. Cit.*, pp. 27-28.
[21] J. B. Nash, *Op. Cit.*, p. 344.

Fresh teachers can lend a spirit of enthusiasm and action to such a program. Fatigued teachers will fail to have this spontaneity and the whole program will suffer along with a general lowering of regard for the administration and personnel of the recreation and physical education program, which will result in this department suffering in periods of economic stress and strain.

OBJECTIVES AND DUTIES OF THE PHYSICAL EDUCATION TEACHER

An interesting report which should be included in a survey of teacher load is that regarding "What we should do and what we do." Of all the teachers in the school faculty, the teacher of physical education often is thought of being and is called on to be, the "jack of all trades." The many jobs around the school plant and grounds become his tasks. The following report made by twelve teachers of physical education in the Oakland and Berkeley (California) high schools will explain the situation.[22]

"What are the proper duties or functions of physical education teachers in secondary schools? A study has been made by teachers in the Oakland and Berkeley high schools to find out what physical education teachers do on the job. Twelve teachers from the Oakland and Berkeley high schools kept a record of everything they did on the job for two days. These duties were then analyzed and classified into the following categories: enrollment routine, scheduling duties, tournaments, advance preparation, vocational, social, and moral guidance, professional advice to superiors, first aid, student organizations, organization of activities, faculty committees, teaching physical education, duties assigned by the principal, general routine, and miscellaneous duties. Following this analysis, the teachers made another accurate record of their duties for six teaching days. These duties were arranged under the above-named categories, and later combined into a single report. Many interesting conclusions can be drawn from the facts assembled. Had a time record been kept additional interpretations of much value would have been available. The general conclusion was that after other numerous but necessary duties had been performed, teachers had little time left in which to teach physical education. Even with a knowledge of duties of secondary teachers of physical education we cannot assume that all of them are necessary or should be performed. Undoubtedly they perform many duties which should be performed by others; and leave undone others which are in need of being done. The duties of teachers in this field can be determined only from an analysis of desirable objectives of a program which must first be set up."

RESULTS OF TOO HEAVY TEACHING LOAD IN PHYSICAL EDUCATION

It is the opinion of many persons, who have had opportunities for rather widespread and varied observations, that many physical education teachers carry teaching loads so heavy that it is almost impossible to plan constructively, and to make desirable professional growth. Herbert R. Stolz, when he was State Supervisor of Physical Education in California, made a study of the relationship between teaching load and the results obtained by the teachers. The evidence he gathered indicated that when a

[22] Committee on the School Child, *Op. Cit.*, pp. 224-225.

teacher taught more than twenty-five periods each week, the quality of the results declined.

"The physical strain upon the teacher of too much work produces a decided effect upon his actions and attitudes as well as his emotional stability. These factors directly affect the child. There is no field in education which demands more in the way of energetic activity, enthusiasm, spontaneity, and forceful leadership than does the field of physical education. Therein often lie the secrets of the benefits of the program of physical education. In order to produce educational results the teachers must not be overworked. As the physical strain on the teacher is relieved some of the results will be more opportunity for follow-up, improved teaching, and more attention to individual differences."[23]

SUMMARY

1. Immediate steps should be taken to stabilize and equalize the teaching loads. The problem should be fairly and thoroughly investigated.

2. The pupil-hour criterion of teacher load does not cover the total amount of work done. It leaves out all duties outside of the actual classroom and does not take into account the fact that some subjects are more difficult to teach than others.

3. On the pupil-hour basis the physical education teacher far exceeds all other teachers in all sections of the country.

4. In comparing the opinions of administrators and teachers the latter vote physical education more difficult to teach by 37 per cent.

5. Administrators must be educated regarding the difficulty of teaching and supervising physical education activities.

6. A new, extensive field in education is being evolved in the extra-class and extra-curricular activities.

7. Some subjects in the school curriculum are more conducive to extra-class and extra-curricular activities than are others. The major activities are athletics, music, dramatics, and forensics.

8. No one has arrived at a decision regarding the relative difficulty of supervising extra-curricular activities and classroom teaching.

9. A survey shows that the physical education teacher carries a full teaching load, is assigned a great number of duties, and carries the largest extra-curricular program in the school.

10. Less than half of the teachers participate in the supervision of extra-curricular activities.

11. Supervision varies from a mere casual oversight to a careful and systematic piece of instructional and administrative work, taxing the time and energies of the teacher to the utmost.

12. Teachers work longer than clerks and skilled laborers according to one survey.

13. Compensation for supervisory work should be made by shortening the classroom teaching load. Compensation by increases in salary are not recommended.

[23] *Ibid.*, pp. 227-228.

14. There is no agreement as to the "standard" teaching load in education or in physical education.

15. Several "Standards for Physical Education Teachers" include:

a) Thirty hours: twenty-five for teaching, five for administration and rest.

b) Thirty-five hours: twenty-five for teaching, five for administration and rest, five for extra-curricular activities.

c) Forty hours: twenty-five for teaching, five for rest, five for after-school work, five for consultations and other duties.

d) Thirty classroom periods per week.

e) Two hundred and fifty pupils per week.

f) Two hundred and fifty pupils per day in five classes plus a maximum of ten hours per week for extra-class activities.

g) Forty periods per week, divided into five for rest, with a choice of twenty-five periods of teaching plus ten periods of extra-class work or thirty-five periods of teaching.

16. The problem of supervision of extra-curricular activities varies with the different activities, varies upon the different educational levels, and because of different types of school organization.

17. The physical education teacher performs many duties unrelated to his field.

18. Objectives of the physical education program upon the various educational levels must be set up and duties performed toward these objectives.

19. One survey showed that when a teacher taught more than twenty-five physical education periods per week a decline resulted in the quality of his work.

20. No real estimate of the teachers' loads can be made that does not take into consideration the following factors:

a) The pupil-hours
b) The classes—age, grading, mentality, discipline, attendance
c) Length of the school day
d) Type of school organization
e) Subjects taught
f) Daily preparation necessary
g) Amount of outside work connected with the class
h) Amount of extra-class work
i) Assigned duties

21. An attempt should be made to meet two requirements in respect to the teaching load: (1) it should be reasonably stable; (2) it should be adjusted to the teacher's ability.

22. The subject is very important from the financial point of view. The costs of education are increased as the size of classes are decreased and as special teachers are brought in.

23. The unanimously accepted means of obtaining a standard teaching load is through the development in administrators, superintendents, principals, and supervisors of an appreciation of the teaching load.

24. Further and more extensive studies should be made by graduate students and those professionally engaged in the field of research.

25. Other means include: publication of the results in school journals and magazines; courses or sections to be given in the organization and administration of physical education for school administrators; adoption of the recommended standards for teaching loads; development of an appreciation of the standard by the other members of the profession and the community.

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College Alumni Evaluate Intercollegiate Athletics

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IT WAS possible, while gathering objective data relative to the vocational success of five hundred alumni of the State University of Iowa,* to have these alumni evaluate intercollegiate athletics on a series of scales constructed according to what is currently believed to be the best technic.

The basic assumption underlying this section of the investigation is that no one is in a better position to evaluate and give expert opinion on intercollegiate athletics than one who has either taken active part in such activities or has been in close contact with them and one who has been away from the college environment long enough to lose any temporary enthusiasm for college sports. It has been generally assumed that alumni become exceedingly irritated if sent a questionnaire of any type, and because of this assumption, most evaluations of college athletics have been made by single individuals. It is a generally accepted scientific principle that little value can be assigned to individual opinion because of the element of personal bias. Studies do not agree on the effect of one college activity on another college activity, therefore, in this study college athletics are to be evaluated on their professed effect upon the social and economic lives of the participants after they leave college.

QUESTION 1

"If you took no part in organized college athletics, please indicate below with numbers your reasons. Number these in the order of their importance as: '1' for the most important; '2' for the next important; '3' for the next; etc." As the majority of alumni indicated only four degrees of importance, the following table gives only the first four ratings.

It is readily seen by examining Table 1 that the three most important reasons given for not participating in college athletics were, in the order of their importance: first, lack of time; second, lack of physical qualifications; and third, greater interest in other forms of college activities. It appears unwarranted for college athletics to assume the blame for the

* M. N. Thisted, Ph.D., "A Study of the Relationship Between Participation in College Athletics and Vocational Success," RESEARCH QUARTERLY, IV:3 (October, 1933), p. 5.

small percentage of the student body that indulges in athletics when consideration is given to the reasons for non-participation in athletics.

TABLE NO. 1

A DISTRIBUTION OF THE RANKS ASSIGNED BY THE ACTIVE GROUP OF ALUMNI TO THE REASONS FOR NOT PARTICIPATING IN INTERCOLLEGIATE ATHLETICS

Reasons	*Alumni Rankings*				
	1st	2nd	3rd	4th	Totals
1. Lack of time to give to it	64	27	13	7	111
2. Believed himself lacking in physical qualifications	48	33	15	2	98
3. More interested in other types of activities	22	40	30	2	94
4. Too much competition	6	8	5	4	23
5. Did not care to be a reserve player and "warm the bench"	2	5	3	4	14
6. Dislike of strenuous varsity training	2	1	6	2	11
7. Dislike of general atmosphere surrounding college athletics	1	3	3	3	10
8. Disliked games involving bodily contact	1	2	4	3	10
9. Tried, but was cut from the squad	4	1	2		7
Number	150	120	81	27	378

QUESTION 2

"Knowing that the opportunities for continuing active participation in football, basketball, and track following graduation are usually very limited, indicate below your reasons in the order of importance for the extent of your participation. Write the numeral 1 before the most important reason; 2 before the next important; etc." As the majority of athletes indicated only five degrees of importance, the following table gives only the first five ratings.

Table 2 shows that over 71 per cent of the athletes took so great a part in college athletics because they actually enjoyed competitive activities of a physical nature, while another 23 per cent assign second or third importance to that reason. Other reasons following closely the one just pointed out were: wanted a varsity letter with all that it signifies; believed in the educational value of athletics; and wanted the physical benefits. One athletic alumnus writes, "I was raised on a farm, used to a lot of hard work, and it was fun for me to take part in athletics."

QUESTION 3

"Please estimate on the following scale the effect that college athletics had upon your efforts to make the most of your college education."

When confronted with this question, less than 2 per cent of the athletes believe that athletics "interfered very much" with their college work, while almost 4 per cent of the active and over 7 per cent of the non-active alumni believe the same to be true. From Table 3 we discover further that

TABLE NO. 2

A Distribution of Alumni Ranking of Reasons for Participating in College Athletics

Reasons	*Ranking**					
	1st	2nd	3rd	4th	5th	Totals
1. Enjoyed competitive athletics	123	34	7	0	4	168
2. Wanted a varsity letter with its prestige	22	45	34	20	13	134
3. Wanted the physical benefits	8	52	41	21	5	127
4. Believed in the educational value of athletics	12	20	30	26	14	102
5. Was urged on by alumni, fellow students, etc.	2	6	12	13	7	40
6. Hoped to become a "star" player, All-American	3	4	8	11	9	35
7. Desired to be adequately prepared to coach as a profession	3	8	6	6	2	25
8. Helped you get jobs around town and on the campus	0	3	4	3	4	14
9. Possibility of becoming a professional athlete	0	1	2		2	5
Number	173	173	144	100	60	650

* When the rankings were reversed and weighted scores assigned to each response, the weighted rankings remained in the same order.

TABLE NO. 3

A Percentage Distribution of the Three Groups of Alumni According to the Extent of Influence that College Athletics Had Upon Their College Education

Groupings	Number	Interfered Very Much	Interfered Somewhat	No More Than Other Factors	Considerable Help	Great Help
		per cent	*per cent*	*per cent*	*per cent*	*per cent*
A. Athletes	176	1.7	13.1	24.4	40.4	20.4
B. Active	80	3.75	3.75	57.5	28.7	6.3
C. Non-Active	97	7.22	10.3	50.5	28.8	3.2
Totals	353	3.68	10.4	38.9	34.6	12.4

47 per cent of all the alumni consider college athletics as of considerable or even great help, 38.9 per cent do not believe that athletics interferes more than other factors, while only 14 per cent believe that athletics interfered to some extent with the securing of a college education. Dr. Wilkins is quoted in *Bulletin Number 24*, of the Carnegie Foundation for the Advancement of Teaching, as saying that "the new indictment against football is precisely this, that intercollegiate football, as at present conducted, interferes seriously with the education of the 98 per cent, that is, the

general mass of undergraduate students" (xxiii). It would appear that, if more reliance can be placed upon the mature judgments of 353 university graduates, half of these being non-athletes, than upon the opinion of one individual, the judgments of these alumni should then be presented to the public and the opinions of that single individual relegated to the scrap heap of unreliability. "An inferiority complex was destroyed," writes one athlete, "by my athletic and other campus activities. I was also forced to maintain a better academic standing." Again, "Athletics caused me to work to schedule. It enabled me to visit other schools with our athletic teams."

QUESTION 4

"Please estimate on the following scale the effect that extra-curricular activities (other than athletics or working your way) had upon your efforts to make the most of your college education."

TABLE NO. 4

A PERCENTAGE DISTRIBUTION FOR THE TWO ACTIVE GROUPS OF THEIR ESTIMATES OF THE EFFECT THAT EXTRA-CURRICULAR ACTIVITIES HAD UPON THEIR EFFORTS TO GET THE MOST OUT OF THEIR COLLEGE EDUCATION

Groupings	Number	Interfered Very Much	Interfered Somewhat	No More Than Other Factors	Considerable Help	Great Help
		per cent	*per cent*	*per cent*	*per cent*	*per cent*
A. Athletes	161	1.24	10.0	47.2	29.2	12.4
B. Active	145	.68	6.9	24.1	38.5	29.6
Totals	306	.98	8.5	36.0	33.7	20.6

It appears from Table 4 that less than 10 per cent of the 306 alumni, active in extra-curricular activities, believe that these activities interfered with the securing of a college education. Over 54 per cent actually believe that participation in such activities furthered their "efforts to make the most of your college education." One alumnus writes, "My only regret is that I did not take a more active part in extra-curricular activities." Another writes, "Got in the habit of presiding at meetings; can't get over it."

QUESTION 5

"Did you consider the practice sessions, games, contests, etc., connected with your activities in college a series of enjoyments or drudgeries?"

Whenever a former college athlete expresses himself in the press or some periodical as believing that the majority of college athletes, especially football players, do not enjoy playing the game, such opinion is given wide publicity and applauded by the opponents of college athletics.

George Owen is quoted in 1925 as writing, "I believe quite frankly that the majority of college football players do not enjoy playing the game." Jefferson Burrus, although testifying that college athletics was a real pleasure to him, does some thinking for the rest of the athletes and says that they found athletics "sadly out of joint with our university life."

TABLE NO. 5

PERCENTAGE DISTRIBUTION OF THE ATHLETIC AND ACTIVE GROUPS ACCORDING TO THEIR ESTIMATES OF ENJOYMENT OR DRUDGERY CONNECTED WITH PRACTICE SESSIONS AND GAMES OR CONTESTS

Groupings	Number	Drudgery				Even Balance		Enjoyable		
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Athletes										
a. Practice Session	176	2	0	1	2	15	4	15	11	49
b. Contests	176	1	0	0	0	7	1	4	11	76
Active										
a. Practice Sessions	106	1	2	2	2	16	6	14	16	41
b. Contests	91	0	1	2	0	10	5	12	16	52

It seems reasonable to believe that more reliability should be placed upon the reactions of 176 athletes, a large number of whom were as successful athletes in the Big Ten Conference as those whose individual opinions have received such wide publicity, than upon these individual opinions. This is especially true as the latter wrote their opinions for the specific purpose of publication, while the athletes in this study had no such purpose. The data in Table 5 prove the falsity of the published opinions in that 95 per cent of the athletes assert that the practice sessions were enjoyable or at least an even balance between enjoyment and drudgery, while 175 of the 176 athletes assert that the actual games or contests were enjoyable or an even balance. To counteract the quoted statement of Mr. Owens, our table shows that 76 per cent of the athletes asserted that they enjoyed playing the games to the highest degree.

Table 5 indicates the degree to which active alumni enjoyed the practice sessions and contests in connection with their extra-curricular work. There are but 5 per cent who considered practice sessions a drudgery, while only 3 per cent considered the actual contests a drudgery.

QUESTION 6

"If you had your college days to live over again, and assuming that there are no reasons, physical or economical, that would interfere, to what extent would you take active part in intercollegiate athletic sports?"

It would seem that one of the best tests of the values placed upon certain college activities is the degree to which alumni would take part in these if they had their college days to live over again. It is not surprising

to find in Table 6 that the former athletes are almost unanimous in their desire to take part in athletics if they had the chance, but it is surprising to note the extent to which the two non-athletic groups assert that they would participate if they could repeat their college days. Over 50 per cent of these non-athletes state that they would take "considerable" or "very active" part in intercollegiate athletics, while only 11 per cent state that they would repeat their previous non-participation in college athletics. It appears that even the non-athletes now realize that there are certain values accruing from intercollegiate athletics that they would consider important in the training afforded by college and university life.

TABLE NO. 6

A Percentage Distribution of the Degree to Which the Alumni State They Would Participate in Intercollegiate Athletics if They Had Their College Days to Live Over Again

Groupings	Number	Degree of Athletic Participation			
		None	Some	Considerable	Very Much
		per cent	*per cent*	*per cent*	*per cent*
A. Athletes	176	1.71	9.6	39.2	49.5
B. Active	160	13.7	36.8	38.7	10.6
C. Non-Active	146	9.5	31.5	41.2	17.8
Totals	482	8.08	25.3	39.6	27.0

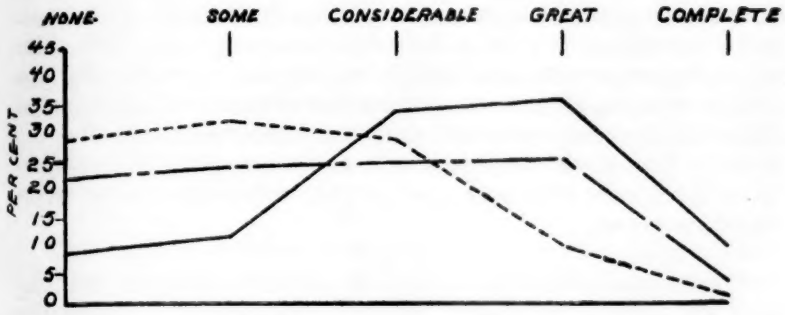
QUESTION 7

"If, during your college career, you discovered ways of eating, sleeping, resting, and exercising that are conducive to physical and athletic excellence, to what degree do you estimate that such procedures of good hygiene, of keeping fit, have carried over into your activities since graduation?" (Figure 1).

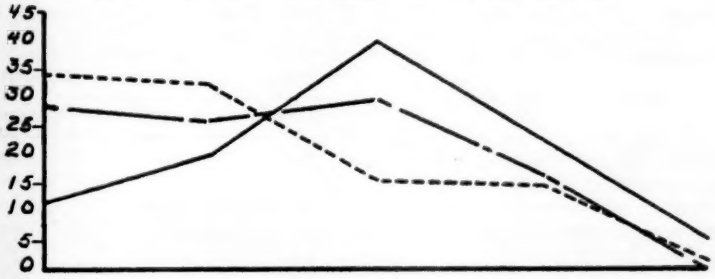
One of the crucial tests of the value of any activity or learning is the degree to which it continues to function in adult life. In this study two approaches were made to the problem of the efficacy of college sports and other physical education activities in providing a carry-over into adult life. First, each alumnus was asked to indicate the amount of carry-over into his daily life since graduation that he believes is due to procedures of good hygiene and keeping physically fit, which he learned in college. The second approach was through an objective measure of this carry-over in which each alumnus indicated the number of years and the frequency (daily, weekly, etc.) of his participation in the several sports which adults most frequently indulge in. The results obtained through this second approach have been reported elsewhere in the report of this study.

The results of the first approach are found in Figure 1 and indicate a definite tendency for the athletes to report a greater amount of carry-over

a. Amount of carry-over during first five years



b. Amount of carry-over during the 11th to 15th years



c. Amount of carry-over during the 21st to 25th years

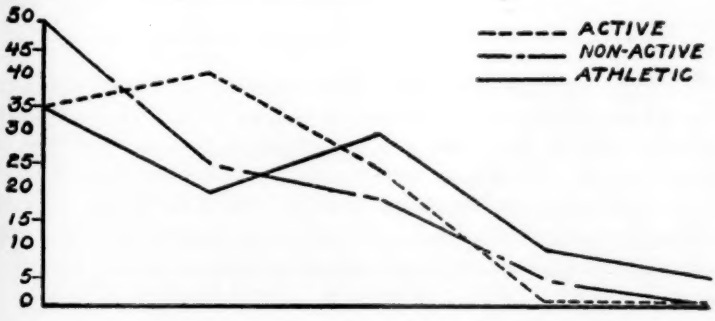


FIGURE 1.—A percentage distribution comparing the three groups of alumni on the amount of carry-over into adult life of values derived from physical education learnings while in college.

into adult life than is true for either of the other groups. This difference becomes more and more apparent as the number of years since graduation increases. During the first five years following graduation, almost 80 per cent of the athletes, 40 per cent of the active group, and 53 per cent of the non-active group report "considerable" or more carry-over. For those who have been out of college twenty-one years or more, we find 5 per cent of the athletes reporting "complete" carry-over, while none of the other two groups indicate similar carry-over, and 100 per cent of the athletes report "great" carry-over while only 5 per cent of the non-active group report similar carry-over.

QUESTION 8

"If you were advising a boy, with the physical and mental qualifications, who will enter college next fall as a freshman, to what extent would you advise him to take part in the following types of athletic activities?"

TABLE NO. 8

A Distribution by Alumni Groupings of Their Advice as to the Amount and Type of Athletic Activity a Qualified Boy Should Take Part In

Type of Athletic Activity	Athletes	Active	Non-Active
	per cent	*per cent*	*per cent*
Required physical education only	1.1	2.6	6.9
Required physical education and voluntary exercises only	3.9	13.6	20.6
Intramural or class games only	0.0	5.2	2.07
One intercollegiate sport	9.5	23.3	24.7
One intercollegiate and one intramural sport	25.8	31.2	19.4
Two intercollegiate and one or more intramural sports	35.4	13.6	15.2
Three intercollegiate sports	21.4	6.5	8.6
Depends entirely upon the boy	2.8	3.9	2.75
Number	178	154	145

This study has attempted to get alumni evaluation of the various college activities directly, and in this section we hope to get an indirect evaluation which may be more valid and less subject to personal bias than the direct evaluation. The alumni were instructed to advise a boy, with the physical and mental qualifications, as to the extent he should take part in various forms of athletics. A few in each group evaded the task of making decisions by stating that it depends entirely upon the boy himself.

Very few of the alumni, according to Table 8 would be satisfied with having the boy confine his athletic experiences to required physical education, intramural or class games, the percentages for the three groups being: athletes—5.0 per cent; active—21.4 per cent; and non-active—29.5 per cent. There is a definite tendency for more in the two non-athletic groups to advise no intercollegiate athletics than is true in the athletic

group, but the surprising thing to be noted is that, not only do 92 per cent of the athletes advise one or more intercollegiate sport, but 75 per cent of the active group and 68 per cent of the non-active group advise the same thing. There can be no doubts in the mind of the reader that the alumni of this University believe that certain values accrue to the boy who goes out for varsity athletics. The writer believes that because of the lack of any systematic bias in making the selections of alumni for this study, he has secured the attitudes of typical alumni of this University.

QUESTION 9

"Indicate your estimate of the extent to which the following factors influence (1) the securing of your first position, and (2) the subsequent progress that you have made in your business or profession."

TABLE NO. 9

FACTORS THAT INFLUENCE THE SECURING OF THE FIRST POSITION AND SUBSEQUENT PROGRESS ON THE PART OF THE ATHLETIC GROUP

Factors	Degree of Influence					
	None	Some	Considerable	Great	Entirely	Total
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	
A. Prominence in college athletics						
(1) Securing first position	55	9.7	12.3	11.1	12.3	171
(2) Subsequent progress	48	22.2	11.7	13.4	2.35	171
B. Prominence in non-athletic activities						
(1) Securing first position	75.5	10.1	8.8	4.4	1.26	159
(2) Subsequent progress	70	13.9	10.1	3.15	.67	159
C. Academic achievement						
(1) Securing first position	52.6	20.6	15.0	8.7	3.12	161
(2) Subsequent progress	49.2	14.9	19.3	13.1	3.73	161
D. Professional preparation						
(1) Securing first position	29.3	10.4	20.1	20.7	19.5	164
(2) Subsequent progress	19.7	6.7	21.5	31.3	20.8	164
E. Family connections						
(1) Securing first position	80	7.4	4.9	4.9	3.07	163
(2) Subsequent progress	81.5	9.2	5.5	3.0	.63	163

It is not possible, because of the necessity for brevity, to include all of the data compiled in this study. It was therefore considered advisable to present only the answers given by the athletes to this question. These can be found in Table 9. Our analysis of the vocational status of these alumni, reported in another paper, indicates without any doubt that these men are in general successful to a considerable degree. It should therefore be of interest to all to know the particular factors present during the college career which influenced their later successful careers. The factor of

"family connections" appears to exert little influence on the athletic group as over 80 per cent report "none." This estimate holds true for the other two groups. "Professional preparation" is rated the highest of all factors by the athletes as well as by the other groups. Considerable credit is given by the athletes to their "prominence in college athletics" as nearly half of them indicate that factor as exerting some degree of influence, and nearly one-fourth of them indicate that the influence was "great" or "entirely." The reader should not conclude that such reports were to be expected as most of these successful athletes are in coaching positions, because a tabulation of the vocations of the athletes in this study shows that only fourteen or 7.8 per cent of these men are college or public school coaches or athletic directors.

How does the amount of influence of "prominence in college athletics" for the athletes compare with the amount of influence of "prominence in extra-curricular activities" for the active group? Of the active group only 19 per cent stated that their activities in college influenced their progress in vocational life "considerably," "greatly," or "entirely," while 27.4 per cent of the athletes assign similar degrees of influence to their athletic activities.

There would seem, therefore, to be a tendency for college athletes to acquire more delayed values from their athletic experiences in college than do the active students from their type of activities.

DIRECT MEASUREMENT OF THE ATTITUDES OF ALUMNI TOWARD ATHLETICS

The measurement of attitudes has been developing rapidly during the past few years chiefly through the leadership of Dr. L. L. Thurstone of the University of Chicago. The customary thing to say when one investigates and measures attitudes is that the truth of the matter does not enter into the results. Yet, an infinite number of educators, psychologists, and laymen can be quoted as believing that the attitudes of human beings are probably the most potent factors that determine human behavior. The definition of the term "attitude" as used in this study is one of the four reported by a committee of the American Psychological Association; namely, "a stabilized set or disposition." The question is therefore, "What do selected alumni of the University of Iowa believe to be the truth concerning the values of athletics during the college career and in later life?"

The usual method of measuring attitudes is to give a series of statements concerning the factor under investigation and request the subject to check each statement as to whether he agrees, disagrees, or cares to make no decision. The writer's criticism of this method is that it is an "all or none" proposition, no allowance being made for more than degree of agreement or disagreement. For the purpose of this study, an attitude scale was constructed which allows for two degrees of the truth of a statement, two degrees of the falseness of a statement, and a neutral degree in

which the rater believes that the truth and falseness of a statement balance each other.

In any study where alumni are chosen at random, 90 per cent or more will be men who did not take any part in intercollegiate athletics during their college career. It is obviously an injustice to the athletes to draw conclusions from the attitudes towards athletics expressed by a sampling in which they do not have equal representation with the non-athletes, for in the last analysis they are the individuals best qualified to express valid attitudes, sets, or dispositions towards this important problem.

In this study the proportion of non-athletes to athletes is less than two to one, and comparisons will be made between the athletes' attitudes and those of the other two groups separately and as one larger group.

STATEMENT NO. 12.—"ATHLETICS DEVELOP THE ATTITUDE OF COLLECTIVE EFFORT AND TEAM PLAY"

TABLE NO. 10

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F**	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	1.7	4.0	94.4	1.8	9.5	88.5	3.6	8.5	87.8
Active	2.6	18.6	78.8	11.9	25.8	62.3	13.5	25.8	60.6
Non-active	4.96	10.9	84.2	11.6	20.8	67.5	13.2	25.0	61.5

* In the following Tables 10–21, the letters are to be interpreted as follows: *FF*=absolutely false; *F*=somewhat false; *FT*=neutral or part false and part true; *T*=somewhat true; *TT*=absolutely true. The totals have been combined into three columns for this publication to conserve space.

It will be noted from Table 10 that not only do about 90 per cent of the former athletes evaluate this statement as "true" or "very true" but over 80 per cent of the two non-athletic groups evaluate it in similar manner as regards active athletic competition and about 60 per cent indicate similar value as regards other college and later life activities.

STATEMENT NO. 13.—"ATHLETICS DEVELOP REAL FRIENDSHIPS"

TABLE NO. 11

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	0.5	3.4	96.4	2.55	7.0	90.5	1.8	9.2	88.7
Active	3.3	16.1	80.7	8.45	18.4	73.2	8.1	19.7	72.8
Non-active	4.7	12.6	82.6	7.6	19.3	73.2	10.1	18.0	71.7

It is at once evident from Table 11 that these college alumni evaluate very highly the friendship-producing characteristics of college athletics. The three groups agree very closely in believing that the most important resultants of participation in college athletics are the real friendships that are formed then and which persist in later life. As one alumnus put it, "Athletic activities keep alive for all time to come, the acquaintanceships and friendships made while in athletics. This can greatly help one and he not be aware of it."

STATEMENT NO. 14.—"ATHLETICS DEVELOP COLLEGE SPIRIT AND LOYALTY TO OTHERS"

TABLE NO. 12

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	1.1	5.8	93.1	2.52	12.8	84.8	5.46	11.7	82.8
Active	4.67	20.8	74.5	14.95	22.0	63.1	13.5	28.6	57.9
Non-active	7.04	13.3	79.8	11.8	22.0	67.0	14.1	20.5	65.0

The response of alumni to this statement indicates that athletics provide the motive and opportunity for the development of college spirit and a unifying loyalty to fellow students. It is noteworthy that the non-athletes agree so closely with the athletes relative to the carry-over of these qualities into adult life.

STATEMENT NO. 15.—"ATHLETICS DEVELOP A CALMNESS, COOLNESS FOR USE UNDER TRYING CONDITIONS"

TABLE NO. 13

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	2.8	9.9	87.1	5.8	11.6	82.7	3.0	13.0	84.0
Active	5.93	24.7	69.0	12.8	28.4	57.8	14.8	22.6	61.2
Non-active	8.6	19.5	71.8	14.1	23.5	62.3	14.0	25.0	60.6

Over 60 per cent of the non-athletic alumni indicate this statement to be true or very true under all three conditions, while almost 85 per cent of the athletic alumni give athletics great credit for developing this worthwhile quality. One alumnus stated his reaction in the following words: "I am of the opinion that my athletic activities developed my physical self to withstand the stress and strain of competition in the business world."

STATEMENT NO. 16.—"ATHLETICS DEVELOP CONFIDENCE, COURAGE"

TABLE NO. 14

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	1.1	6.3	92.4	2.56	13.4	83.9	2.4	11.7	86.0
Active	1.0	19.0	80.0	9.2	24.8	66.2	6.08	29.2	74.6
Non-active	6.2	15.5	78.3	11.1	21.9	67.1	14.0	23.7	61.9

Approximately 80 per cent of the non-athletes and over 92 per cent of the athletes believe that college athletics develop confidence and courage that are useful during the athletic games and about 70 per cent of the non-athletes and 86 per cent of the athletes believe that these qualities carry-over into later life. One alumnus, a successful corporation executive, stated his reaction to this statement in words which merit quoting: "The good that has come to me as result of the athletic experiences in school has been invaluable. The chief characteristic in respect to such resulted from an evaluation of myself that took place while I was on the track team. I seem to have possessed an inferiority complex, almost insurmountable, when first entering into athletic competition, but after coming into contact with other athletes in competition I learned to realize that others were not so superior to me as to justify my considering myself as inferior and when I came into competition with men who were rated as exceptional and found that they were not superhuman nor exceptionally qualified, I began to place myself on a higher plane and rapidly came to the conclusion that no man should be accepted on his reputation only and that I should not greatly fear the contact which would result in competition with me. In other words, from then on I never believed a man was better than I unless he proved himself to be so and that, after all, others possessed the same characteristics as I and were just as susceptible to failure as I."

STATEMENT NO. 17.—"ATHLETICS DEVELOP INITIATIVE"

TABLE NO. 15

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	6.35	13.3	80.5	7.7	21.9	70.2	9.3	16.8	74.0
Active	8.72	30.0	61.1	17.4	38.0	44.7	17.77	35.8	46.4
Non-active	17.0	17.8	65.3	15.8	22.0	62.5	24.9	27.0	48.1

This table indicates that there is a lack of agreement amongst the alumni relative to the development of initiative through college athletics.

They agree quite closely on this development in active athletics, but in other college and in later life activities less than one-half of the non-athletic alumni assign this particular value to athletics while nearly three-fourths of the athletic alumni assign carry-over values to athletics in the direction of developing initiative.

STATEMENT NO. 18.—"ATHLETICS DEVELOP LEADERSHIP"

TABLE NO. 16

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	5.6	15.0	79.5	8.3	16.6	75.1	7.4	20.4	72.2
Active	10.7	29.0	60.1	17.7	32.7	49.7	22.4	34.7	43.1
Non-active	14.8	22.6	62.4	18.0	27.0	55.0	22.8	28.0	49.2

It appears from this table that approximately three-fourths of the athletes and about one-half of the non-athletes believe that athletics develop leadership. Although these figures are not exceptionally low, it would seem that they should be much higher in order to verify claims made of the training for leadership that is inherent in college athletics. Greater effort should be made on the part of athletic directors and coaches to have the athletic activities provide for opportunities for leadership training on the part of their athletes. It is apparent from the responses of these alumni that a large number believe that the coaches dominate almost completely the type of play and selection of plays used in the intercollegiate contests. One alumnus writes that athletics "taught the value of obeying orders; and how to carry out orders."

STATEMENT NO. 19.—"ATHLETICS DEVELOP BODY POSTURE"

TABLE NO. 17

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	6.9	16.3	76.5	7.8	22.0	70.0	7.4	21.8	70.8
Active	8.7	16.8	74.5	11.0	23.2	66.4	12.8	26.5	60.7
Non-active	5.7	14.1	80.2	6.0	21.5	72.5	8.2	26.0	65.5

There is close agreement between the three groups of alumni on their estimate of the effect of athletics on body posture. Between two-thirds and three-fourths of all alumni believe that athletics develop body posture.

STATEMENT NO. 20.—"ATHLETICS DEVELOP PHYSICAL VIGOR"

TABLE NO. 18

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	1.1	8.6	90.4	3.8	11.8	84.5	3.6	17.9	78.6
Active	3.6	20.4	75.6	10.6	27.0	62.4	17.1	32.5	50.8
Non-active	5.5	10.1	84.5	7.7	15.5	76.7	13.2	21.5	65.1

The non-active and athletic groups of alumni are in rather close agreement that college athletics do develop physical vigor, which is not only true as applied to active athletic competition, but that there is a considerable carry-over into other college and later life activities. This compares favorably with objective data, on the amount of sports activity continued in by the athletic alumni, found elsewhere in this study. One alumnus testifies that "athletic competition always stimulated study with me. Physical well-being carries one through the ennui of long study." Another says: "I was able to accomplish more with less effort in my school work, during the fall and winter when I was playing football and basketball."

STATEMENT NO. 21.—"ATHLETICS SUBDUE UNDESIRABLE HABITS"

TABLE NO. 19

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	9.1	16.0	75.0	11.8	18.4	69.8	16.7	23.5	60.6
Active	23.6	34.5	42.0	24.3	38.0	37.5	30.6	38.0	31.3
Non-active	13.2	26.0	61.2	20.6	25.8	53.6	26.6	32.3	41.1

The interesting data in this table are the responses of the athletes to statement twenty-one. It is to be noted that 75 per cent of the athletes believe that athletics do subdue undesirable habits during the days of active competition, 69 per cent indicate the same value in other college activities while 60 per cent believe there is a definite carry-over of this repression into adult life. One alumnus remarks "I enjoyed athletics more than I did spending my time in politics or playing pool." Another states, "Time thoroughly occupied with athletics, precluding deleterious activities."

The three groups of alumni agree quite closely in their estimate of the part athletics plays in teaching the value of emotional stress in actual competition, athletic, other college, and later life competition. By emo-

STATEMENT NO. 22.—"ATHLETICS TEACH THE VALUE OF EMOTIONAL STRESS IN THE FACE OF COMPETITION"

TABLE NO. 20

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	3.4	15.7	80.5	7.8	18.4	73.8	11.8	18.6	69.6
Active	10.3	15.8	74.2	13.1	32.0	55.1	16.5	31.0	52.5
Non-active	12.6	16.3	71.1	15.6	24.1	59.8	17.5	28.0	54.5

tional stress is meant the same thing as when we speak in psychology of facilitation of neural impulses. The percentages in every case are more than fifty. From voluntary comments given by alumni the writer believes that these alumni do not value emotional stress for its own sake (undue neural strain being recommended by no one) but that the athletic contests provide training in subjecting emotional stress to voluntary control.

STATEMENT NO. 23.—"ATHLETICS DEVELOP A FEELING OF UNJUSTIFIABLE SUPERIORITY OR SNOBBERY ON THE PART OF THE 'STAR' ATHLETE"

TABLE NO. 21

	In active athletic competition			In other college activities			In later life activities		
Groups	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*	*FF&F*	*FT*	*T&TT*
Athletes	41.4	38.0	20.8	40.2	38.3	21.4	51.6	35.5	13.0
Active	23.8	44.0	31.9	23.1	41.6	35.1	40.6	39.8	19.2
Non-active	22.0	33.6	44.5	22.1	30.0	47.9	37.6	32.0	30.4

The athletes are very outspoken in their declaration that this by-product of athletics does not develop in very many "star" athletes, the opinion of critics to the contrary. Only 20 per cent consider the statement true as applied to activities in college while only 13 per cent consider it true when applied to later life activities. The non-athletic groups believe to a somewhat greater extent that this statement is true. Individual comments contributed by alumni in this study are in general agreement that this charge is true of only a few star athletes, most of whom are by nature "snobbish." "In my opinion," writes one athletic alumnus, "I have found that as a general rule, the so-called 'stars' are more modest and unassuming than others, who 'also ran.'" Another one writes, "most *real* 'star' athletes are modest and get their big kick out of their love for the game."

GENERAL SUMMARY AND CONCLUSIONS

A unique attempt was made by the writer in the construction of his questionnaire to secure the reactions of alumni on the values that they place upon the several college activities that would be the result of a thorough recapitulation of their own college experiences. They were asked first for a ranking of the reasons for participating or not participating in intercollegiate athletics. They were then asked to evaluate athletics and other extra-curricular activities from the point of view of interference with other college work and from the point of view of the amount of enjoyment or drudgery connected with these non-academic activities. A question was then asked as to the extent of their participation in college athletics, "if you had your college days to live over again." They were then asked to give their subjective estimates of the carry-over value into later life of physical health learnings taught in college and an objective estimate of the extent of active participation in adult sports since graduation. Following this, the alumni were asked to advise a prospective college freshman (male) on the type of academic and non-academic activities he should undertake and to state in terms of hours per day the amount of time he could profitably devote to each. They were then asked to indicate the influence that each type of college activity had upon their vocational progress. The writer believed that the recapitulation necessary for these reactions would condition each alumnus for a critical, unprejudiced (as far as such is possible) evaluation of the characteristics which college athletics are said to develop.

The conclusions that appear to be warranted from an analysis of the reactions of the alumni are:

1. The athletes take active part in college athletics because they enjoy not only the games but also the practice sessions and because athletics was of help to them not only during their college career but also in their vocational, social, and physical health pursuits.

2. The non-athletic groups did not participate in college athletics because of lack of time or interest in other activities; they do not believe that athletics or extra-curricular activities interfered with their college education; they endorse college athletics to the extent that they would participate if they could live their college careers over again; they take part in less than one-third as much physical exercise in the adult sports as do the athletes; they advise practically the same type of activities for the college boy, including intercollegiate athletics, as do the athletes.

3. The three groups of alumni agree that their professional preparation had the most influence in their vocational progress, followed by the academic preparation, while the athletes assign considerable influence to their success in athletics.

4. Although a larger percentage of the athletes than of non-athletes believe the statements made concerning the values accruing from athletics are true or very true, the very fact that only a small percentage of the non-

athletes believe these statements to be false, leads us to believe that college athletics has on the whole more valuable by-products than it has harmful ones.

While it is possible for a strict scientist to challenge the implication that these values may be due to the athletic environmental factors, nevertheless, when such a large group of mature men state that they believe these statements to be true, their judgments must be given considerable weight.

College athletics is relatively unorganized from the point of view of striving for a development of the several values assigned to it, and the fact that, even in this unorganized condition, such a large number of alumni claim many values for it, leads us to contemplate what the resulting effects upon students would be if the program were to be organized for the specific purpose of developing the desired characteristics.

It appears from the alumni attitudes that they do not believe that intramural sports or class games should be substituted for intercollegiate athletics. They believe there is a place in this University for both, and several suggest that the way to make athletics and intramural sports enjoyable, educational, health-building, etc., is through the selection of highly trained coaches who understand human psychology, human physiology, and are men of the highest integrity.

The Study of Age, Height, Weight, and Power as Classification Factors for Junior High School Girls

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During the last few years the field of physical education has, along with general education, shown an increasing use of tests for classification. Various methods for classifying have been studied, tried, and in increasing numbers of instances actually used in setting up class registrations.

This particular study centers around the use of "power" factors for classifying; *power* being defined in the mechanical sense of "the time rate of work." To state that power is a highly important factor in athletics is to state the obvious. Among other tests used in our field, to measure another attribute closely related to athletic performance, are the strength tests.[1]† These measure *strength*, differentiated from *power* in that strength tests measure the *force* available, but not how *effectively* this force can be used at speed. In other words, the time or velocity element is lacking. We have also studied the influence of the almost universally recorded measures of age, height, and weight to athletic performance.

This general problem, as applied to junior high school girls, was developed in three stages:

1. The influence of age, height, and weight in track and field athletics for junior high school girls.
2. The Sargent jump as a measure of power.
3. The best combination of age, height, weight, and Sargent jump for predicting athletic ability.

Miss Mary Delaney of Detroit in 1927 [2] reported a research somewhat like that of our first problem in which she studied the relationships of age, height, and weight to athletics in an age group nearly identical to this one. However, this very important difference marks the athletic data in the two studies, in that in Miss Delaney's study the events used were not *practised*, and no corrections for random errors of performance were made. Certain comparisons are, however, drawn with that study.

Various studies of the Sargent jump have previously been made, best

† Numbers refer to bibliography at end of article.

known perhaps being those by D. A. Sargent, L. W. Sargent, C. H. McCloy, and by Bovard and Cozens.‡

These have in each case, with the exception of the study by L. W. Sargent, dealt only with data regarding men and boys. In directing our angle of inquiry into this part of the study we endeavored to eliminate sampling errors by *practising* the event and by correcting for daily random variations in performance.

Our subjects for this study were two hundred girls in junior high school, with an age range of twelve to sixteen years. They were selected from the regular physical education classes on the basis of normality of motor abilities, rejecting those with very low apparent motor abilities, and those at the two extremes of over- and underweight.

The recording of age, height, and weight was done in the usual manner, the school nurse cooperating both in measuring and in giving us access to data in her files. Only one record was made of these variables. The bulk of the measuring was done in class time, class leaders having previously been trained to help in the tasks of securing the data.

Before measuring the Sargent jump, certain methods were first tried out on the leaders. In the first place the apparatus for measuring the jump had to be devised and then a technique developed and standardized so that the records of all individuals would be recorded in the same way. After some experimenting, the following routine was established. A paper chart was taped securely to the wall of the gymnasium, marked off accurately in inches and half-inches, the half-inch lines being only half as long as the inch lines. We decided upon a uniform distance of ten feet from the wall for a stool, upon which the tallest girl among the leaders stood to watch the outline of the head of the subject upon the chart. A circle, eighteen inches in diameter, was drawn on the floor, at such a distance that when the subject crouched in preparation for the jump her elbows would have free swinging distance from the wall. The means for holding down the hair was also a matter of experimentation. The proposed bathing cap was discarded because all the girls did not have their caps at school, and it took too long to put them on, if borrowed. Instead, a silk tri-cornered scarf was used, which could be quickly tied under the chin. The use of this device, by the way, dubbed the event "the peasant jump," which somehow tickled the fancy of the girls. Duplicates of this chart and a description of the technique were hung on each of the four walls of the gymnasium, so that the girls could practice at will.

When actually gathering the data, three girls participated in the measuring. One stood on the stool, watching the silhouette. The girl to

‡ While there is not a great deal of literature on the subject, especially as it pertains to girls, a review of what references there are regarding the second part, namely the Sargent jump, is to be found in the paper by C. H. McCloy published in the RESEARCH QUARTERLY, Vol. III, No. 2, page 235, May, 1932, titled: "Recent Studies in the Sargent Jump." We shall not repeat this bibliography here. The technique of the jump, as used in this study, is described there.

be measured took her stand against the wall. The "stool girl" called out the inch (to the nearest half-inch) of the girl's standing height (as seen against the chart). (This was not necessarily her *actual* height but the record on the chart.) Then the subject, standing as she was in the circle, jumped. The stool girl called out the height to the nearest half-inch which the head-outline reached at its highest point in the jump. From this measure was subtracted the first record mentioned—that of the standing height—the result being the desired datum. This was done twice. Two girls, with pads and pencils, sat on either side of the stool girl and quickly "figured" the jump, and also checked to see if the girl stayed in the circle. This immediately checked the accuracy of the arithmetical process, and then the class leader, who sat near, recorded the higher of the two jumps as soon as the two computers agreed upon it. All stool girls were trained in advance so they had uniform methods of watching the silhouette. For the final recording, however, only one stool girl was used, which made the procedure of the reading of the jumps practically uniform for all subjects.

The set-up of this study indicated that the event was to be practised each class period the same length of time as the track and field events, namely three weeks. The girls were in general somewhat familiar with a jump of this kind, having the jump-reach test among a previous series of tests. However, it was necessary to show them the knack of snapping the arms down quickly at the apex of the jump, to add the additional inch or so which such technique insures. The mechanics of it were taught in two class periods in the usual "floor" manner. Class leaders again had practiced it first and were of great value in helping the other girls to master it. The rest of the practice was part of the regular squad work in the three-week period.

The measuring of the selected track and field events was also organized by the class leaders, and definite procedures decided upon. The crouch start was used for the "potato" race of four lengths of the gymnasium. Blocks or potatoes were not used; the subjects simply touched the wall, and changed direction. A regular stop watch was used for the timing.

The standing broad jump had both the practice and the final test-jump mats marked out with one-inch lines. One mat was used for each age, by years. Yellow chalk was used to indicate a "fair" jump for that age, red chalk an "excellent" jump for that age, and white chalk marked the inches. The fair and excellent records were taken from the Philadephia chart in Bovard and Cozens.[3] These colored lines motivated the effort of each age group. Again the form of the jump was stressed, and class leaders trained their squads diligently for three weeks.

The basketball throw for distance produced the difficulties in mastering its form that it usually has for girls, but a fair amount of skill was finally perfected. The throw was measured in feet and half-feet, a "rule"

being marked off on the floor in a fairly permanent way along a black line the length of the gymnasium. For recording all of the track and field events a squad formation was used, with assistance from the class leaders, except in the case of the potato race. Here only one girl recorded, since it was necessary to train her for accuracy in reading the stop watch.

After three weeks of intensive training, two sets of test records were made in the manner and with the technique described above. The second test was, of course, not given on the same day. Scoring tables were now made up according to the following plan. In brief the scheme was as follows: A distribution was made of the entire list of records for each track event. The mean and the standard deviation were then computed. The distance of three standard deviations on each side of the mean was adopted as the range for scoring. From this the detailed scoring tables were computed. Each girl was scored in each event, from her records and the scores added to give "total points." This scoring was done twice, using the two sets of tests.

In all of the correlations, corrections were made for random performance errors by the statistical device usually called the "correction for attenuation." There are several formulae suggested for this purpose. We chose the one in which the records made on the *different* days were correlated against each other, as this seemed most sure of meeting the necessary assumption underlying the valid use of this method, namely that the random errors of performance are uncorrelated both with performance and with each other. The formula used was:

$$r_{xy} = \sqrt{\frac{r_{x_1y_2} \cdot r_{x_2y_1}}{r_{x_1x_2} \cdot r_{y_1y_2}}}$$

(For an extended discussion of this method see G. U. Yule, *Introduction to the Theory of Statistics*, Chas. Griffin & Co., Limited, 1924, p. 213.)

All correlations reported below have been thus "corrected."

In the following discussion, we shall use subscripts as follows:

p = points
s = Sargent jump
a = age
h = height
w = weight

We are now ready to detail the findings regarding the influence of age, height, and weight on track and field events for junior high school girls. The results of the zero order correlations follow:

$r_{pa} = .1897$
$r_{ph} = .1520$
$r_{pw} = .0547 \pm .0474$
$r_{ah} = .4001$
$r_{aw} = .2342$
$r_{hw} = .6185$

It is readily seen that the correlation of "points" with weight is very low, hardly more than its probable error, and we dropped it at this point.

To see if age and height were of any importance, the multiple correlation was computed finding $R_{p.ah}$ to be .2089 as compared to the original r_{ps} of .1897. It would seem, then, that weight and height, as they affect classification for track and field for girls, might as well be dropped. In this respect our findings were comparable to those of Miss Delaney,[2] and the fact that our study involved practicing the events did not materially alter the conclusions.

The second phase of the study was that of determining the value of the Sargent jump as a predictor of athletic power. This was accomplished by the simple device of correlating it with athletic points. The resulting correlation was $r = .6039$. Apparently this event predicts athletic ability fairly well at this age level.

3. To predict points when we have Sargent jump, age, height, and weight, we need three new zero correlations, namely,

$r_{sa} = .0505$
$r_{sh} = .1962$
$r_{sw} = .0000$

Here again it was seen that weight is of no value, and it was dropped from further consideration.

To evaluate the relative importance of Sargent jump, age, and height for predicting points we computed partial correlations as follows:

$r_{ps.ah} = .6032$
$r_{ph.as} = .0410 \pm .047$
$r_{pa.hs} = .1996$

Because of this result, we dropped height, but retained age tentatively. Now it can be seen how close the result of the partial correlation between points and the Sargent jump with age and height constant (.6032) is to the zero order correlation of points with Sargent jump (.6039).

We next computed the multiple correlations of the Sargent jump, age, and height with points, finding $R_{p.sah}$ to be .6254. Now, predicting points from Sargent jump and age alone, omitting height, we secured the result $R_{p.sa} = .6247$. These results, again, are so alike that they confirm the results of our partial correlation, namely that height adds nothing significant to the predictive value. However, by contrasting the multiple correlation of $R_{p.sa}$ of .6247 with the zero correlation of $r_{ps} = .6039$, we find that to add age raises it approximately 7 per cent in predictive value (by a comparison of coefficients of alienation).

If one wishes to combine the Sargent jump and age for purposes of classification, the following modified multiple regression formula may be used:

1½ (Sargent jump in inches) + 1(age in years).

This formula is slightly better for predicting athletic ability than is the Sargent jump alone.

To use either the Sargent jump records or the modified multiple regression formula, the records for all girls should first be secured, and a distribution made. The teacher will make such divisions of this distribution as she thinks wise.

CONCLUSIONS

So far as the junior high school *girls* are concerned, we may conclude from this study that:

1. Age, height, and weight alone are of very little value for classifying for athletic competition. If we wish to use any of these variables, however, we might use *age* alone. (In this study the increase in points continued through the sixteenth year.)

2. The Sargent jump alone is almost as good as the Sargent jump and age for predicting track and field points, and height and weight add nothing of significance.

Since the Sargent jump is so simple, takes no apparatus that could not be constructed in half an hour, and correlates *as highly* (.6039) as *any other* test, it would seem then to be a valuable addition to a battery for testing girls for the purpose of classifying them for individual athletic performance.

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The Organization and Administration of Laboratory Experience in Teaching Physical Education*

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THE PROBLEM

THE PURPOSE of this study is to establish principles governing the organization and administration of laboratory experience in teaching physical education; to survey the current policies and prevailing practices in providing laboratory experience in teaching for prospective physical education teachers; and to evaluate these current policies and prevailing practices in terms of validated criteria.

The organization and administration of laboratory experience in teaching physical education is concerned with:

1. The selection and direction of a laboratory school staff in physical education.

2. The provision of facilities to conduct laboratory experience in teaching physical education.

3. The provision for, and the conduct of, an integrated program including all essential types of laboratory experience in teaching physical education.

4. The allotment of sufficient time for, and the appropriate location in the curriculum of, the essential types of laboratory experience in teaching physical education.

5. The preparation of student teachers for, the assignment of student teachers to, and the rating of student teachers in, laboratory experience in teaching physical education.

A BRIEF HISTORY RELATING TO THE PROBLEM

Laboratory experience in teaching has probably always been a factor in the professional preparation of teachers. The first normal school established in Europe, at Rheims in northern France, provided for practice teaching under experienced teachers.[1] The first normal schools in this country, established in Massachusetts, provided laboratory experience in teaching in "model schools."[2]

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* An abstract of a thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the School of Education of New York University, 1932.

[1] Elwood P. Cubberley, *A Brief History of Education*, Chapter XXVIII. Boston: Houghton Mifflin Company, 1922.

[2] A. R. Mead, *Supervised Student Teaching*, Chapter I. New York: Johnson Publishing Company, 1930.

Legislative enactments in eight states during the war period, 1915 to 1919, prescribed physical education for the public schools. Previously to 1915 only three states had adopted such laws. The post-war period, 1919–31, added twenty-four more states to this group, making the total thirty-five.

The pioneer work in the preparation of teachers of physical education was done mainly by private institutions. These legislations created a demand for professionally trained teachers that the early existing institutions could not meet; therefore many of the public teacher-training institutions, and endowed colleges and universities began to prepare these special teachers to meet this increasing demand. At the present time the institutions offering professional preparation in physical education might be classified in four groupings:

1. Public normal schools and teachers colleges.
2. Public colleges and universities.
3. Endowed colleges and universities.
4. Private schools of physical education.

Providing facilities, leadership, and a program for laboratory experience in teaching has always presented problems, and the increase of enrollment in professional physical education curricula has added to the complexity of these problems.

DEFINITIONS

Laboratory Experience in Teaching.—Laboratory experience in teaching is an inclusive term which refers to the phase of teacher preparation by which the student gains experience in, and develops a technic of, teaching through contact with classroom situations.

Observation of Teaching.—Observation of teaching is that phase of laboratory experience in which a master teacher demonstrates the technic of teaching for student teachers who observe the methods and procedures.

Participation in Teaching.—Participation in teaching is that intermediate stage of laboratory experience in which the student, after observing the technic of the training teacher, assists in some of the teaching activities. It serves as preparation for student teaching.

Student Teaching.—Student teaching is that phase of laboratory experience in which the student teacher assumes responsibility for the conduct of teaching activities under the guidance of a training teacher. This type of laboratory experience is often termed practice teaching and sometimes apprentice teaching.

Experimental Teaching.—Experimental teaching refers to the demonstration of, participation in, or experimenting with, the newer theories of education.

Director of Laboratory School.—The director of laboratory schools is the individual responsible for the organization and administration of

all laboratory school work, including that of physical education. Director of training and director of practice are terms also used to designate this administrative officer.

Supervisor of Laboratory Experience in Teaching.—A supervisor of laboratory experience in teaching is an individual who supervises a number of demonstration teachers, training teachers, and student teachers in a specific teaching field, such as physical education.

Demonstration Teacher.—A demonstration teacher is a master teacher who demonstrates the technic of teaching for student teachers who are assigned for observation.

Training Teacher.—A training teacher is a master teacher who guides and directs a student teacher during the student teaching assignment. Synonomous terms often used are critic teacher, critic, supervising teacher, training supervisor, and cooperating teacher.

Student Teacher.—A student teacher is one who is enrolled in a preservice professional teacher-preparation curriculum.

Campus Laboratory School.—A campus laboratory school is a school on, or in close proximity to, the campus which is used to furnish laboratory experience in teaching, and controlled by the teacher-training institution.

Cooperative Laboratory School.—A cooperative laboratory school is a public or private school used to provide laboratory experience in teaching, by joint agreement of the governing agency of the school and the teacher-training institution.

METHOD AND PROCEDURES

The first procedure in this study was the formulation of criteria relative to the organization and administration of laboratory experience in teaching physical education. A preliminary investigation revealed very little literature pertaining to laboratory experience in teaching physical education. Laboratory experience in teaching has received more consideration and consequently is better developed in institutions preparing elementary and secondary school teachers; hence most of the pertinent literature has been written from this standpoint.

Books, magazine articles, monographs, pamphlets, manuals, and published and unpublished theses were read with the object of searching for suggestions applicable to criteria. From these suggestions tentative criteria of laboratory experience in teaching physical education were formulated. Discussion in a seminar, and conferences with specialists in the fields of teacher training and physical education aided in the refinement of these criteria.

The criteria were submitted for approval to thirty-six competent judges. Twelve of these judges were state directors of physical education, twelve were specialists in the professional preparation of physical education teachers, and the remaining twelve were specialists in teacher

preparation outside of the physical education field. The principles governing the organization and administration of laboratory experience in teaching physical education were established from the validated[3] criteria.

To secure information regarding the current policies and prevailing practices in providing laboratory experience in teaching for prospective physical education teachers, it was necessary to formulate a check list to be sent to institutions offering professional physical education curricula. In formulating the check list used in this survey, an effort was made to parallel the criteria by fact-finding inquiries. Discussion in a seminar and conferences with specialists in the fields of teacher training and physical education also aided in the final development of the check list.

These check lists were sent to institutions preparing physical education teachers. The survey is based upon the returns from ninety-one of the institutions.

PRINCIPLES GOVERNING LABORATORY EXPERIENCE IN TEACHING PHYSICAL EDUCATION

All laboratory experience in teaching physical education should be under the immediate supervision of an individual professionally trained in physical education. This supervisor should be a full-time staff member of the teacher-training institution and should be administratively responsible to a director of laboratory school work; except that in the case of private schools of physical education, this supervisor may be solely responsible for the laboratory experience in teaching.

This supervisor should possess the following *minimum* qualifications: a professional preparation in physical education equivalent to a master's degree, specialized preparation in laboratory school work, and either administrative or teaching experience in public schools of not less than three years.

Demonstration teachers and training teachers should be master teachers; this involves the possession of a professional preparation in the field of physical education, a rich experience, and personal qualities of a high order. These teachers should possess the following minimum qualifications: a professional preparation in physical education equivalent to a four-year bachelor's degree; specialized preparation in the guidance and direction of student teachers; and administrative or teaching experience in public schools of not less than three years.

The demonstration teachers and training teachers should be selected or approved by the teacher-training institution.

In order to attract and to hold a competent laboratory school staff, demonstration teachers and training teachers should receive additional compensation beyond their salary as public school teachers.

[3] Valid in the sense that they can be supported.

Laboratory school facilities should be provided in the levels for which the teacher-training institution is preparing physical education teachers (e.g., elementary, junor high, senior high, etc.).

Institutions preparing supervisors and administrators of physical education should provide special facilities and a program for laboratory experience in supervision.

Laboratory experience in teaching physical education should be conducted under conditions approximating the actual teaching conditions.

The types of laboratory experience in teaching that the teacher-training institutions should provide are: demonstration of teaching, observation of teaching, participation in teaching, and student teaching. It is desirable that experimental teaching should be provided in selected institutions offering graduate work.

Laboratory experience in teaching physical education should be based upon an analysis of the duties of a physical education teacher. It is desirable that common or constant duties should be included in the laboratory school work. Laboratory experience in teaching should continue for a sufficiently long period, if possible, to furnish experience in those types of activities and responsibilities revealed in the analysis of a physical education teacher's duties. Laboratory experience in teaching should be organized into orderly and progressive units.

Accumulative individual records of all laboratory experience in teaching physical education should be collected and filed in the office of the supervisor or (and) director of laboratory school work.

Student teachers who have had experience in teaching usually should not be exempt from securing laboratory experience in teaching physical education; but the program of laboratory experience in teaching may be modified for such students.

The minimum amount of observation of teaching in physical education, or observation and participation, should be forty-five clock hours.

There should be the following prerequisites for the observation of teaching in physical education:

1. Preliminary learning of facts in theory and subject-matter courses, and of skills when desirable.

2. Preliminary learning of how to observe, record data, and make analysis of data derived from such a study of teaching. This may be accomplished by a general conference at the beginning of the course, and instruction by means of manuals or guides.

Each period of group observation should be supplemented by a group conference with the demonstration teacher. This conference may either precede or follow the demonstration lesson.

As a means of economy of time and effort, there should be some form of printed or mimeographed regulations and suggestions for students assigned to the observation of teaching in physical education.

The minimum amount of student teaching in physical education should be ninety clock hours. It is desirable that student teaching should be done mainly during the last year of the student's preservice training.

Student teaching in physical education should be preceded by the courses, "Educational Psychology," "Principles of Teaching," and "Observation of Teaching." It is desirable to include "Principles of Education" as a prerequisite.

In assigning students for student teaching in physical education the following should be observed:

1. Student teaching assignments should be made subject to change. Adjustments should be made, or student teacher should be relieved from assignment, if conditions justify.

2. Student teachers should not usually be assigned for laboratory experience to training teachers who do not want them.

3. Student teachers should not be assigned to training teachers who are not qualified to guide and direct their training.

4. The student's interests, aptitudes, and capacities should be considered in making the assignments.

The number of student teachers assigned to each training teacher for one hour of student teaching daily should not exceed three.

Lesson plans should usually be made by the student teacher under the guidance of the training teacher. It is desirable that these plans should be detailed for beginners, becoming briefer as proficiency in teaching is being acquired.

Students should be rated on achievement in student teaching in physical education and the records of these ratings should be filed for reference.

For supervision of laboratory experience in teaching physical education to be effective, the student teacher should have access to the following types of books:

IN EDUCATIONAL THEORY

[4]* Educational Psychology
* Principles of Education
* Principles of Teaching
Philosophy of Education

IN THE SPECIAL FIELD OF PHYSICAL EDUCATION

* Principles of Physical Education
* Organization and Administration
* Physical Education Activities
* Personal Hygiene
* Corrective Gymnastics
Public Hygiene

Follow-up work by the teacher-training institution is an essential supplement to a well organized laboratory school system. Such follow-up work to consist of:

[4] Those marked with an asterisk are essential, the others desirable.

1. Reports from superintendents, principals, and supervisors about teachers in their schools who are recent graduates of the institution.
2. Reports from beginning teachers themselves.
3. Personal letters to beginning teachers when need arises.
4. Personal visitation, inspection, and conference with beginning teachers.
5. Conferences at the teacher-training institution of graduates of previous year.

SURVEY OF THE CURRENT POLICIES AND PREVAILING PRACTICES IN PROVIDING LABORATORY EXPERIENCE IN TEACHING FOR PROSPECTIVE PHYSICAL EDUCATION TEACHERS

The survey, conducted to reveal the current policies and prevailing practices, is based upon the returns from ninety-one institutions. Ninety-six returns were received; five of these were not included inasmuch as they might have caused an incorrect representation of present conditions. Two of these institutions offer professional curricula on the graduate level only, two institutions offer a few professional courses as a "minor elective," and the fifth institution offers a few courses in "athletic coaching" for prospective "academic" teachers who might wish to become "teacher-coaches." The following facts summarize the findings of the survey:

Twenty-eight of the institutions were public normal schools and

TABLE I

NUMBER OF INSTITUTIONS INCLUDED IN SURVEY AND PROFESSIONAL CURRICULA OFFERED IN PHYSICAL EDUCATION

Curricula Offered	*Group I*[5]	*Group II*[6]	*Group III*[7]	*Group IV*[8]	*Total*
Two-Year Curriculum	1	0	1	0	2
Two- and Three-Year Curricula	0	0	0	1	1
Two- and Four-Year Curricula	2	0	0	0	2
Three-Year Curriculum	1	0	0	1	2
Three- and Four-Year Curricula	5	0	2	5	12
Four-Year Curriculum	19	32	21	0	72
Graduate Curriculum[9]	1	13	6	0	20
Number of Institutions Included	28	32	24	7	91

[5] Group I, Public Normal Schools and Teachers Colleges.
[6] Group II, Public Colleges and Universities.
[7] Group III, Endowed Colleges and Universities.
[8] Group IV, Private Schools of Physical Education.
[9] These institutions also offer a four-year curriculum and are not included in the totals.

teachers colleges, thirty-two were public colleges and universities, twenty-four were endowed colleges and universities, and seven were private schools of physical education.

Two of the institutions offer a two-year curriculum only, one offers two- and three-year curricula, two offer two- and four-year curricula, two offer two- and three-year curricula, twelve offer three- and four-year curricula, and seventy-two offer a four-year curriculum. Of the seventy-two institutions offering a four-year curriculm, twenty reported a graduate curriculum also.

In 97.8 per cent of the institutions, laboratory experience in teaching physical education is under the immediate supervision of an individual

TABLE II

PROFESSIONAL PREPARATION OF SUPERVISORS OF LABORATORY EXPERIENCE IN TEACHING PHYSICAL EDUCATION

Preparation	*Group I*		*Group II*		*Group III*		*Group IV*		*Total*	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Graduate Three-Year Curriculum in Physical Education.	0	0.0	0	0.0	0	0.0	1	16.7	1	1.1
Four-Year Bachelor's Degree in Physical Education	12	42.9	10	31.3	9	37.5	4	66.6	35	38.8
Bachelor's Degree in Some Other Field	1	3.6	0	0.0	1	4.2	1	16.7	3	3.3
Bachelor's and Master's Degrees in Physical Education	10	35.7	14	43.6	7	29.1	0	0.0	31	34.4
Bachelor's Degree in Other Field and Master's Degree in Physical Education.	2	7.1	3	9.4	3	12.5	0	0.0	8	8.9
Undergraduate Work in Physical Education, Master's Degree in Other Field	2	7.1	2	6.3	4	16.7	0	0.0	8	8.9
Undergraduate Work in Physical Education, Doctor's Degree in Other Field	1	3.6	3	9.4	0	0.0	0	0.0	4	4.5
No report	0		0		0		1		1	
Professional Preparation in Physical Education and Graduate Degree[10] ..	15	53.5	22	68.7	14	58.3	0	0.0	51	56.7

[10] Derived from preceding tabulation.

professionally trained in physical education. The supervisor is a full-time staff member in 90.9 per cent of the institutions, but is responsible to a director of laboratory school work in only 65.6 per cent of the institutions.

In 56.7 per cent of the institutions this supervisor has had professional preparation in physical education and holds a graduate degree. Only 34.4 per cent of the supervisors have secured both the bachelor's and the graduate degree in physical education.

Sixty-four per cent of the institutions reported that the supervisors have had some type of specialized preparation in laboratory school work.

TABLE III

MINIMUM QUALIFICATIONS IN PROFESSIONAL PREPARATION, REPORTED AS REQUIRED OF DEMONSTRATION TEACHERS AND TRAINING TEACHERS

Preparation	*Group I*		*Group II*		*Group III*		*Group IV*		*Total*	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Graduate Two-Year Curriculum in Physical Education.	1	4.0	3	13.6	2	11.1	1	50.0	7	10.3
Graduate Three-Year Curriculum in Physical Education.	3	12.0	4	18.0	2	11.1	0	0.0	9	13.2
Bachelor's Degree in Physical Education	11	44.0	7	31.8	5	27.8	1	50.0	24	35.3
Bachelor's Degree in any Field ..	10	40.0	5	23.1	8	44.4	0	0.0	23	34.3
Master's Degree in Physical Education	0	0.0	2	9.0	1	5.6	0	0.0	3	4.4
Master's Degree in any Field ..	0	0.0	1	4.5	0	0.0	0	0.0	1	1.5
No report	3		10		6		5		24	

"Specialized preparation" was intended to convey the idea of formal training in professional courses relating directly to laboratory school work. Unfortunately, the returns indicated that the term was interpreted rather broadly. Marginal notations indicated that courses in "Education" and "Supervision" and extended experience in laboratory school work were considered as specialized preparation. Inasmuch as only a few institutions offer professional courses in laboratory school work, the percentage of supervisors who reported specialized preparation is undoubtedly very much higher than it should be.

In 68 per cent of the institutions the supervisor has had three or more years of administrative or teaching experience in public schools.

In 69.6 per cent of the institutions a bachelor's degree is required of all demonstration and training teachers, but only 35.3 per cent require

that the bachelor's degree be in physical education. Only 5.9 per cent require a master's degree.

Specialized preparation in the guidance and direction of student teachers is a requirement for demonstration and training teachers in 51.6 per cent of the institutions, according to the returns. "Specialized preparation" was probably interpreted rather broadly as in the case of the reports relative to supervisors. Several other studies of training teachers, as reported by Armentrout[11] and Mead,[12] indicate that very few have taken courses primarily designed for their work. It is reasonable to assume that laboratory school staffs in physical education have had no more specialized preparation than laboratory school workers in other fields.

Only 39.1 per cent of the institutions require three or more years of administrative or teaching experience in public schools, for demonstration and training teachers, and 30.4 per cent do not require any such experience.

Demonstration and training teachers are selected by the teacher-training institution in 64.7 per cent of the institutions. Only 26.2 per cent of the institutions give additional compensation to these teachers, beyond their salaries as public school teachers. Fifteen of the institutions reported the amount of the additional compensation.

Public Normal Schools and Teachers Colleges

Institution A	$400 annually
Institution B	$200 annually
Institution C	$120 annually
Institution D	$ 80 annually
Institution E	$ 50 annually
Institution F	$ 50 annually

Public Colleges and Universities

Institution G	$25 per pupil annually
Institution H	"Compensation—taking courses at the University without fees"

Endowed Colleges and Universities

Institution I	$120 per student annually
Institution J	$100 annually
Institution K	$ 50 per student annually
Institution L	$ 25 per student annually
Institution M	$ 5 per unit

[11] W. D. Armentrout, *The Conduct of Student Teaching in State Teachers Colleges*, Pp. 176–178. Greeley, Colorado: Colorado State Teachers College, 1928.

[12] A. R. Mead, *Supervised Student Teaching*, Chapter XIX. New York: Johnson Publishing Company, 1930.

Private Schools of Physical Education

Institution N .....$ 25 annually
Institution O .....$ 20 per student annually

Laboratory school facilities are provided by 88.9 per cent of the institutions in the levels for which the teacher-training institution is preparing teachers of physical education (e.g., elementary, junior high, senior high, etc.).

TABLE IV

NUMBER OF INSTITUTIONS PROVIDING CAMPUS LABORATORY SCHOOLS OF VARIOUS LEVELS

Level of Laboratory School	*Group I* Number	Per cent	*Group II* Number	Per cent	*Group III* Number	Per cent	*Group IV* Number	Per cent	*Total* Number	Per cent
Elementary Level	26	92.6	11	34.4	6	25.0	2	28.6	45	49.5
Junior High Level	22	78.6	14	43.7	5	20.8	2	28.6	43	47.3
Senior High Level	17	60.7	16	50.0	6	25.0	2	28.6	41	45.1
Junior College Level	9	32.1	5	15.6	5	20.8	0	0.0	19	20.9
Senior College Level	11	39.3	17	53.1	13	54.2	1	14.3	42	46.2
No Campus Schools	1	3.6	6	18.7	6	25.0	5	71.4	18	19.8

Campus laboratory schools are provided by 80.2 per cent of the institutions. Campus elementary schools are provided by 49.5 per cent, 47.3 per cent provide campus junior high schools, 45.1 per cent provide campus high schools. Campus facilities on the junior college level are provided by 20.9 per cent, and on the senior college level by 46.2 per cent of the institutions.

TABLE V

NUMBER OF INSTITUTIONS PROVIDING COOPERATIVE LABORATORY SCHOOLS ON VARIOUS LEVELS

Level of Laboratory School	*Group I* Number	Per cent	*Group II* Number	Per cent	*Group III* Number	Per cent	*Group IV* Number	Per cent	*Total* Number	Per cent
Elementary Level	10	35.7	24	75.0	14	58.3	7	100.	55	60.4
Junior High Level	9	32.1	24	75.0	15	62.5	7	100.	55	60.4
Senior High Level	8	28.6	23	71.9	15	62.5	6	85.7	52	57.1
Junior College Level	2	7.1	1	3.1	1	4.2	0	0.0	4	4.4
Senior College Level	2	7.1	3	9.4	0	0.0	2	28.6	7	7.7
No Cooperative Laboratory School	11	39.3	3	9.4	2	8.3	0	0.0	16	17.6

Cooperative laboratory schools are provided by 82.4 per cent of the institutions. Cooperative schools on the elementary level are provided by 60.4 per cent of the institutions, on the junior high level by 60.4 per cent, and on the senior high level by 57.1 per cent. Cooperative schools on the junior college level are provided by only 4.4 per cent, and on the senior college level by 7.7 per cent of the institutions.

Marginal notes on several returns indicated that, in the public and endowed institutions, the physical education students conduct the activities of the required physical education classes for students in the other curricula of the teacher-training institution, supervise intramural activities, and coach intramural teams.

TABLE VI

NUMBER OF INSTITUTIONS USING AGENCIES OTHER THAN LABORATORY SCHOOLS TO PROVIDE LABORATORY EXPERIENCE IN TEACHING

Type of Agency	*Group I*		*Group II*		*Group III*		*Group IV*		*Total*	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Boys' Clubs	1	3.6	2	6.3	1	4.2	0	0.0	4	4.4
Boy Scouts	1	3.6	4	12.5	1	4.2	0	0.0	6	6.6
Churches	1	3.6	2	6.3	4	16.7	1	14.3	8	8.8
Girl Scouts	1	3.6	4	12.5	1	4.2	1	14.3	7	7.7
Settlement Houses	0	0.0	2	6.3	3	12.5	1	14.3	6	6.6
Y.M.C.A.	1	3.6	1	3.1	1	4.2	1	14.3	4	4.4
Y.W.C.A.	2	7.1	1	3.1	2	8.3	2	28.6	7	7.7
Y.M.H.A.	0	0.0	0	0.0	1	4.2	0	0.0	1	1.1
Y.W.H.A.	0	0.0	0	0.0	1	4.2	0	0.0	1	1.1
Orphan Asylum .	0	0.0	0	0.0	1	4.2	0	0.0	1	1.1
Playgrounds	0	0.0	0	0.0	1	4.2	0	0.0	1	1.1

Students receive student teaching credit for work done in agencies other than campus or cooperative laboratory schools in 21.6 per cent of the institutions.

Supervisors and administrators of physical education are prepared by 70.1 per cent of the institutions. Only 52.5 per cent of the institutions preparing these supervisors and administrators provide special laboratory facilities for laboratory experience in the supervision of physical education.

Laboratory school work is conducted under conditions approximating the actual teaching conditions in 93.1 per cent of the institutions.

Observation of teaching is provided as a type of laboratory experience in teaching physical education by 83.3 per cent of the institutions. Participation in the teaching of physical education is provided by 73.3 per cent of the institutions. Student teaching in physical education is provided by 97.8 per cent, and experimental teaching is provided by 27.8 per cent of the institutions.

Laboratory experience in teaching physical education is organized into orderly and progressive units in 82.4 per cent of the institutions.

Accumulative individual records of all laboratory school experience in teaching physical education are collected and filed by 57.1 per cent of the institutions.

In 94.2 per cent of the institutions, students who have had previous experience in teaching are not exempt from laboratory experience in teaching physical education, but in 33.7 per cent of the institutions the program of laboratory experience in teaching is modified for such students.

The amount of observation or observation and participation reported as being required of each student ranged from 5 to 288 clock hours with a median of 45 clock hours. Observation of teaching in many institutions is a part of a general laboratory course, *Practice Teaching*, and in such cases the total number of hours devoted to this course was recorded as the requirement for student teaching.

In 95 per cent of the institutions, preliminary learning of facts in theory of subject-matter courses and skills, when desirable, are prerequisite for the observation of teaching in physical education. Preliminary learning of how to observe, record data, and make analyses of data derived from such a study of teaching is prerequisite for the observation of teaching in physical education in 88.8 per cent of the institutions.

Each period of group observation is supplemented by a group conference in 75.9 per cent of the institutions.

Printed or mimeographed regulations, suggestions, manuals, etc., are provided to aid students assigned to the observation of teaching in physical education by 62.4 per cent of the institutions.

Students are assigned to observe teaching done by student teachers in 58.1 per cent of the institutions.

Students are given an opportunity to observe or observe and participate in the teaching of the following activities: physical education class work (activities) by 94.4 per cent of the institutions; health taught as a classroom subject by 67.8 per cent of the institutions; physical examinations by 84.4 per cent of the institutions; individual or corrective gymnastics by 78.9 per cent of the institutions; intramural activities by 90 per cent of the institutions; and athletic coaching by 85.6 per cent of the institutions.

The number of clock hours of student teaching required for graduation ranges from 18 to 400 with a median of 108. Thirty-five per cent of the institutions have a student teaching requirement of less than 90 clock hours. One public institution requiring 60 hours of student teaching in physical education, requires 12 additional hours of student teaching in other subjects. An endowed institution requiring 90 hours of student teaching in physical education, recommends 30 additional hours of student teaching in another subject.

Student teaching is done during the first and second years by 40 per cent, and during the second year only by 60 per cent of the institutions offering a two-year curriculum. Student teaching is done during the sec-

ond and third years by 26.6 per cent and during the third year only, by 66.7 per cent of the institutions offering a three-year curriculum. Student teaching is done during the third and fourth years by 36.6 per cent and during the fourth year only by 50 per cent of the institutions offering a four-year curriculum.

TABLE VII
ALLOCATION OF STUDENT TEACHING IN THE CURRICULUM

Curricula and Allocation	*Group I* Number	[13]*Per cent	*Group II* Number	*Per cent	*Group III* Number	*Per cent	*Group IV* Number	*Per cent	*Total* Number	*Per cent
Two-Year Curricula										
First and Second Years .	0	0.0	0	0.0	1	100.	1	100.	2	40.0
Second Year ...	3	100.	0	0.0	0	0.0	0	0.0	3	60.0
Three-Year Curricula										
First, Second, and Third Years	0	0.0	0	0.0	0	0.0	1	14.3	1	6.7
Second and Third Years ..	1	16.7	0	0.0	1	50.0	2	28.6	4	26.6
Third Year	5	83.3	0	0.0	1	50.0	4	57.1	10	66.7
Four-Year Curricula										
First, Second, Third, and Fourth Years .	0	0.0	0	0.0	1	4.3	1	20.0	2	2.4
Second, Third, and Fourth Years	2	8.3	1	3.3	1	4.3	0	0.0	4	4.9
Second and Fourth Years .	1	4.2	0	0.0	0	0.0	0	0.0	1	1.2
Third Year	1	4.2	1	3.3	2	8.7	0	0.0	4	4.9
Third and Fourth Years .	11	45.8	8	26.7	9	39.2	2	40.0	30	36.6
Fourth Year ...	9	37.5	20	66.7	10	43.5	2	40.0	41	50.0
No report	2		2		0		0		4	

The principal courses in education, exclusive of courses in physical education, considered as prerequisite for student teaching are: *Educational Psychology* by 85.5 per cent of the institutions; *Principles of Education* by 74.4 per cent; *Principles of Teaching* by 67.8 per cent; *Observation of Teaching* by 51.1 per cent; *History of Education* by 48.9 per cent; and *Educational Sociology* by 30 per cent of the institutions.

In assigning students to student teaching, the student's interests, aptitudes, and capacities are considered in making the assignments by 79.1 per cent of the institutions. These assignments are made subject to change; adjustments are made or the student teacher is relieved from the assignment if the conditions justify in 82.3 per cent of the institutions.

[13] Asterisk indicates per cent calculated in terms of curricula reported, not in terms of institutions reported.

Student teachers are sometimes assigned for student teaching to training teachers who do not want them in 44.3 per cent of the institutions, and are sometimes assigned to training teachers who are not qualified to guide and direct their training in 50.7 per cent of the institutions.

For the sixty-four institutions reporting the number of student teachers assigned to each training teacher for an hour of student teaching daily, the median is two students.

TABLE VIII

THE COURSES IN EDUCATION REPORTED AS PREREQUISITE TO STUDENT TEACHING IN PHYSICAL EDUCATION

Courses	*Group I*		*Group II*		*Group III*		*Group IV*		*Total*	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Educational Psychology	26	92.9	24	75.0	22	95.7	5	71.4	77	85.5
Educational Sociology	10	35.7	8	25.0	4	17.4	5	71.4	27	30.0
History of Education	9	32.1	15	46.9	16	69.6	4	57.1	44	48.9
Principles of Education	20	71.4	24	75.0	18	78.3	5	71.4	67	74.4
Principles of Teaching	20	71.4	20	62.5	16	69.6	5	71.4	61	67.8
Observation of Teaching	16	57.1	14	43.7	11	47.8	5	71.4	46	51.1
Educational Tests and Measurements.	0	0.0	0	0.0	0	0.0	1	14.3	1	1.1
Introduction to Teaching	1	3.6	0	0.0	1	4.3	0	0.0	2	2.2
Principles of Secondary Education	1	3.6	0	0.0	0	0.0	0	0.0	1	1.1
Philosophy of Education	0	0.0	0	0.0	1	4.3	0	0.0	1	1.1
School Hygiene	0	0.0	1	3.1	0	0.0	0	0.0	1	1.1
Technique of Teaching	0	0.0	1	3.1	0	0.0	0	0.0	1	1.1
Child Growth and Development	1	3.6	0	0.0	0	0.0	0	0.0	1	1.1
Public Education in the United States	0	0.0	0	0.0	1	4.3	0	0.0	1	1.1
No Prerequisites	0	0.0	1	3.1	0	0.0	1	14.3	2	2.2

Lesson plans are made by the students alone in 47 per cent of the institutions; 43 per cent require the lesson plans to be made by both the student teacher and the training teacher. Lesson plans are required to be detailed for beginners, becoming briefer as proficiency in teaching is acquired, in 65.5 per cent of the institutions.

In 89.8 per cent of the institutions the student teachers are rated on achievement in student teaching and the records are filed for reference.

A student who fails to pass his laboratory school teaching must repeat the work in 38.6 per cent of the institutions, fails to graduate in 46.6 per cent, and graduates providing his other work is acceptable in 14.8 per cent of the institutions. Approximately half of the institutions indicating that the student fails to graduate will permit the student to repeat the work. Two institutions permit students who fail to change to another "major." Another institution "urges" students who fail to change to another "major." Three of the institutions permitting students who fail to graduate, will not recommend them. The report from one institution had two marginal notations, "We have no failures—there are varying degrees of success."

TABLE IX

ACTIVITIES IN WHICH STUDENT TEACHERS HAVE AN OPPORTUNITY TO ASSUME RESPONSIBILITY DURING STUDENT TEACHING ASSIGNMENT

Activities	*Group I*		*Group II*		*Group III*		*Group IV*		*Total*	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Physical Education Class Work (activities)	25	92.6	31	100.	24	100.	7	100.	87	98.0
Health Taught as a Classroom Subject	9	33.3	12	38.7	10	41.7	4	57.1	35	39.3
Physical Examinations	15	55.6	16	51.6	14	58.3	5	71.4	50	56.2
Individual (corrective) Gymnastics	11	40.7	24	77.4	16	66.7	6	85.7	57	64.0
Intramural Activities	22	81.5	25	80.6	20	83.3	7	100.	74	83.2
Athletic Coaching	22	81.5	28	90.3	18	75.0	6	85.7	74	83.2
No Report	1		1		0		0		2	

Student teachers are given an opportunity to assume responsibility in the following activities during their student teaching assignment: physical education class work (activities) by 98 per cent of the institutions; health taught as a classroom subject by 39.3 per cent; physical examinations by 56.2 per cent; individual or corrective gymnastics by 64 per cent; intramural activities by 83.2 per cent; and athletic coaching by 83.2 per cent of the institutions.

The total semester hours (i.e., subject matter, theory and practice) reported as being required for graduation from the 4-year curricula ranged from 118 to 136 with a median of 124 semester hours. The number of semester hours of laboratory experience in teaching physical education, reported from the same group of institutions, required for graduation ranged from 3 to 12 with a median of 6 semester hours. The per cent of the total semester hour requirement devoted to laboratory experience in

teaching physical education (same group of institutions) ranged from 2.42 to 10 per cent with a median of 4.92 per cent.

The principal types of books in educational theory reported as being accessible to student teachers are: *Educational Psychology* and *Principles of Education* by 97.8 per cent of the institutions; *History of Education* by 94.4 per cent; *Principles of Teaching* by 93.3 per cent; *Educational Sociology* by 92.2 per cent; and *Philosophy of Education* by 87.6 per cent of the institutions. *Educational Tests and Measurements, Mental Hygiene,* and *Educational Hygiene* were also mentioned.

The principal types of books in the special field of physical education reported as being accessible to student teachers are: *Physical Education Activities* and *History of Physical Education* by 98.9 per cent of the institutions; *Principles of Physical Education, Organization and Administration,* and *Personal Hygiene* by 97.8 per cent; *Corrective Gymnastics* by 95.6 per cent; *Public Hygiene* by 94.4 per cent. The following were also mentioned: *Anatomy, Applied Anatomy, Athletic Coaching, Camping, First Aid, Health Education Material, Kinesiology, Magazines, Methods in Physical Education, Physical Examinations, Physiology, of Exercise, Play, Scouting, Syllabi,* and *Tests and Measurements in Physical Education.*

Some type of follow-up work of beginning teachers, as a supplement to laboratory experience in teaching physical education, is conducted by 82.4 per cent of the institutions. Reports from superintendents, principals, and supervisors about teachers in their schools who are recent graduates of the teacher-training institutions are secured by 64.6 per cent of the institutions. Reports from beginning teachers themselves are secured by 46.4 per cent of the institutions. Personal letters are sent to beginning teachers when need arises by 75 per cent of the institutions. Personal visitation, inspection, and conference with beginning teachers is a part of the follow-up work in 43.1 per cent of the institutions. Conferences at the teacher-training institution of graduates of the previous year are held by 36 per cent of the institutions. Marginal notations on many of the reports indicated that the follow-up work is haphazard and poorly organized.

RELATIONSHIP OF CURRENT POLICIES AND PREVAILING PRACTICES TO THE ESTABLISHED PRINCIPLES

An evaluation of the current policies and prevailing practices, as revealed in the survey, shows varying degrees of conformity to the validated criteria and principles established in this study.

1. The following are the current policies and prevailing practices, in providing laboratory experience in teaching for prospective physical education teachers, in which there is a marked tendency to conformity:

(a) Those relating to the supervision of laboratory experience in teaching physical education under a full-time staff member professionally trained in physical education.

(b) Those relating to the provision of student teaching as a type of laboratory experience in teaching physical education.

(c) Those relating to the conduct of laboratory experience in teaching physical education under conditions approximating actual teaching conditions.

(d) Those relating to the provision for the modification of the program of laboratory experience in teaching physical education for students who have had previous teaching experience.

(e) Those relating to the preliminary learning of facts in theory and subject-matter courses, and of skills when desirable, as prerequisite for the observation of teaching.

(f) Those relating to the provision for student teaching to be done mainly during the last year of the student's preservice training.

(g) Those relating to the preparation of lesson plans by the student teacher under the guidance of the training teacher.

(h) Those relating to the rating of students on achievement in student teaching, and the filing of these records for reference.

(i) Those relating to the provision of adequate library facilities available for student teachers.

2. The following are the policies and practices in which there is a lack of conformity worthy of notice:

(a) Those relating to the provision of facilities for laboratory experience in teaching in *all* levels for which the institution is preparing teachers of physical education.

(b) Those relating to the provision of demonstration, observation, and participation in teaching as types of laboratory experience in teaching physical education.

(c) Those relating to the provision for the organization of laboratory experience in teaching physical education into orderly and progressive units.

(d) Those relating to the provision for laboratory experience in teaching the common or constant duties of a physical education teacher.

(e) Those relating to the provision for group conference to supplement each period of observation of teaching.

(f) Those relating to the preliminary learning of how to observe, record data, and make analyses of data derived from such a study of teaching as prerequisite for observation of teaching.

(g) Those relating to the minimum time requirement (clock hours) in the observation of teaching.

(h) Those relating to the assignment of students for student teaching, according to their interests, aptitudes, and capacities.

(i) Those relating to the making of student teaching assignments subject to change if conditions warrant.

(j) Those relating to the number of student teachers assigned for an hour of student teaching daily to each training teacher.

3. The following are the policies and practices in which there is a decided lack of conformity:

(a) Those relating to the responsibility of the supervisor of laboratory experience in teaching physical education in relation to a director of all laboratory school work.

(b) Those relating to the qualifications of the supervisor of laboratory experience in teaching physical education.

(c) Those relating to the provision of facilities for laboratory experience in supervision in institutions preparing supervisors and administrators of physical education.

(d) Those relating to the selection of the laboratory school staff by the teacher-training institution.

(e) Those relating to the collection and filing of accumulative individual records of all laboratory experience in teaching physical education.

(f) Those relating to the provision of printed or mimeographed manuals, regulations, etc., to aid students assigned to the observation of teaching.

(g) Those relating to the assignment of students for student teaching to training teachers who do not want them.

(h) Those relating to the courses in education, exclusive of courses in physical education, considered as prerequisite for student teaching.

(i) Those relating to the minimum time requirement (clock hours) in student teaching.

(j) Those relating to the type of lesson plans.

(k) Those relating to the provision of a well-organized follow-up system for beginning teachers as a supplement to laboratory experience in teaching physical education.

4. The following are the policies and practices in which there is a positive lack of conformity:

(a) Those relating to the qualifications of the demonstration and training teachers.

(b) Those relating to the compensation of the laboratory school staff.

(c) Those relating to the assignment of students for student teaching to training teachers who are not qualified to guide and direct their training.

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Report of the Committee on Curriculum Research

By Professor Wm. R. LaPorte, Chairman
University of Southern California

THE COMMITTEE on Curriculum Research has now been in operation for six consecutive years following its first appointment in December, 1927. As might naturally have been expected, the possibilities have increased tremendously as the study has progressed. It has been necessary to modify the plan of procedure frequently in order to keep pace with the expansion. The aggressive attack seems of necessity to have settled down into a long-term siege. The report of the Chairman submitted herewith will deal with progress made by certain subdivisions of the Committee. Part I will outline the present plan of organization and procedure. Part II will present some of the findings of Subcommittee II. Part III will present a report from Subcommittee III. Part IV will offer recommendations for continuation of the study.

The chairman regrets that it is not possible to submit definite reports from each of the five subcommittees. Subcommittees I, IV, and V have not yet been able to get their material in shape for a report, but are making progress.

I. THE PRESENT PLAN OF PROCEDURE

It will be recalled that two years ago the committee was enlarged by the addition of two new members, making a total of five, with the understanding that each member of the committee would serve as director of a specific division of the committee work, carrying it on intensively in his own institution through the medium of graduate research studies, extending over a period of years.

The assignment of responsibilities to the committee members were as follows:

Division I. Determination of Aims and Objectives (based on specific needs at various age levels in terms of physical, social, mental, and emotional factors)—Frank L. Oktavec, College of the City of Detroit.

Division II. Selection and Adaptation of Activities (involving school division placement, time allotment, and determination of specific teaching elements)—W. R. LaPorte, University of Southern California.

Division III. Determination of Suitable Teaching Situations and Teaching Techniques (involving extensive experiments to determine those best fitted to secure desirable results)—C. L. Brownell, Teachers College, Columbia.

Division IV. Formulation of Standardized Achievement Tests (involving formulation and experimentation with achievement tests in the fields of motor skills, information, and attitude)—C. H. McCloy, State University of Iowa.

Division V. Establishing Appropriate Administrative Standards (involving experimental study of administrative techniques governing program, equipment, and staff)—Frank Lloyd, New York University.

As was anticipated, this plan of procedure will necessitate elaborate study, and results of course will be slow. In the end, however, it promises to offer a very sound scientific foundation for the physical education program.

II. REPORT OF SUBCOMMITTEE II.—SELECTION AND ADAPTATION OF ACTIVITIES

During the past year the Chairman has attempted further studies in the field of selection and adaptation of activities as the work of Subcommittee II. This study has been divided into two parts; *first,* a questionnaire study of possible adaptations of the report of last year for use in the girls' program; *second,* a research study of the activities in common use as indicated by programs outlined in various state and city manuals in the United States.

1. *Questionnaire Study of Possible Adaptations to the Girls' Program.*—Many inquiries have come to the Chairman in the past two or three years as to whether the program being studied by our committee was adaptable to the girls' field. On being informed that it was purely a boys' study they have urged strongly that an effort be made to adapt the program for the use of the girls. The Chairman accordingly gave careful study to the situation in an effort to determine a short-cut method of adapting the program to the girls' field. Since much of the work on the evaluation had been made by women teachers already, it hardly seemed essential to duplicate this work. The problem seemed mainly then to be one of selection and assignment to school divisions, and the determination of time allotment for the various activities.

With this in view, he formulated a questionnaire check sheet which was mimeographed and sent to the members of the National Association of Directors of Physical Education for Women in Colleges and Universities. Part I of this check sheet consisted of chart No. 3 of the Fifth Annual Report of the Committee for 1932. This was a summary table showing placement and time allotment of activities for the various school levels. Part II of the check sheet consisted of blank spaces with similar headings where the raters were asked to indicate the changes they would make from the boys' program to make it suitable for the girls. Table I, presented herewith, is a copy of the form sent to the women. In order to save printing space, Table I also includes the final scores for time allotment resulting from this questionnaire study. The scores under the head-

ing of "time allotment" for the suggested changes for the girls' program, are in terms of the medians of the scores from the various raters.

One hundred check sheets were mailed. Thirty-one were received in return. A large number of the women members wrote letters in reply stating that they found it very difficult to make a check on the activities as requested without going into it more elaborately. Others felt that they were incapacitated to do such work, because of the fact that they were out of touch with the school levels below college. Still others felt that the study was such an important one and the program sufficiently different for girls, that it should be carried on as an independent study by a group of women.

Many of the charts returned were accompanied by a comment that the rater found it difficult to limit a given activity to two school divisions alone. In some cases they felt it should cover three school divisions and in some cases, all four school divisions. In such cases it was necessary for the Chairman, in tabulating data, to select the two school divisions in which the rater gave the highest percentage of time allotment. This seemed to be the only way in which the study could be made uniform.

Under the circumstances, the results of the study were very far from satisfactory. On the other hand, a very large percentage of those returning the check sheets expressed great enthusiasm over the project and hoped that the material might be presented in published form. The Chairman accordingly decided to tabulate data and present the findings herewith for what they are worth. It should be understood, of course, that the results are not representative of the total membership of the Society, but merely indicate opinions of a selected small number of leaders in the field.

A study of Table I, Part II, will disclose some rather interesting results. It will be noted that in the main, the actual placement of activities parallels quite closely that for the boys, with a few exceptions. In many cases the time allotment is very similar, while in others there is a distinct change. Obviously certain activities are left out entirely, including boxing, wrestling, football, and touch football, while two additional important activities appear which were not on the boys' sheet, namely field hockey and natural dancing. A number of additional other activities were mentioned by a few of the raters, but not in sufficient quantity to justify inclusion in the program as separate activities. Most of them could be classified under one of the headings already listed, such as modified games or gymnastic games.

As indicated under the time allotment in Part II of Table I, the suggested program for girls as represented by the composite opinion of the raters in terms of median scores would be as follows:

Intermediate or upper elementary, grades 4 to 6: Swimming and Diving, 10 per cent; Free Exercises, 5 per cent; Gymnastic Games and Relays, 15 per cent; Marching, 5 per cent; Tumbling and Pyramids, 5 per cent; Horseshoes, 5 per cent; Gymnastic Dancing, 5 per cent; Folk Danc-

TABLE I

COMPARATIVE SCHOOL DIVISION PLACEMENT AND TIME ALLOTMENT FOR THE BOYS' AND GIRLS' PROGRAMS

		PART I—BOYS' PROGRAM								PART II							
		Section I				*Section II*				*Suggested Changes for Girls' Program*							
		School Division Place				Time Allotment				School Division Place				Time Allotment			
		Int. 4–6	Jr.Hi. 7–9	Sr.Hi. 10–12	Coll. 13–16	Int. 4–6	Jr.Hi. 7–9	Sr.Hi. 10–12	Coll. 13–16	Int. 4–6	Jr.Hi. 7–9	Sr.Hi. 10–12	Coll. 13–16	Int. 4–6	Jr.Hi. 7–9	Sr.Hi. 10–12	Coll. 13–16
Aqu.	1. Life Saving			223	175			5	7			x	x			5	7
	2. Swimming and Diving	184	204			10	10			x	x			10	10		
Def.	3. Boxing			210	222			5	5								
	4. Fencing			195	165			3	5			x	x			3	5
	5. Wrestling			210	199			5	5								
Gym.	6. Free Exercises	182	112			5	5			x	x			5	5		
	7. Gym. Games & Rel.	229				15				x	x			15	7		
	8. Heavy Apparatus			184	164			5	5			x	x			5	3
	9. Marching	206	111			5	3			x	x			5	5		
	10. Tumbling & Pyramids	152	205			4	10			x	x			5	6		
Ind. Sports	11. Archery			143	146			3	5			x	x			5	7
	12. Golf			219	216			5	10			x	x			5	10
	13. Handball			146	149			5	10			x	x			3	4
	14. Horseshoes	114	162			3	3			x	x			5	3		
	15. Squash			184	219			5	6			x	x			10	5
	16. Tennis		172	167			9	8				x	x			10	10
	17. Track and Field			178	118			10	10		x	x			5	5	

Rhyth.	18. Gym. Dancing	133	159			5	5			x	x			5	5		
	19. Clog Dancing		144	108			5	5			x	x			5	5	
	20. Folk Dancing	140				7				x	x			10	9		
Team Sports	21. Modified Games ...	237				15				x	x			15	10		
	22. Baseball			195	123			10	10			x	x			5	5
	23. Basketball		155	200			10	10				x	x			10	8
	24. Football			214	225			10	10								
	25. Playground Ball ...	211	214			10	10			x	x			10	8		
	26. Soccer	148	212			10	6				x	x			6	5	
	27. Speedball		150	112			5	5			x	x				5	5
	28. Touch Football		193	123			6	5									
	29. Volleyball	137	201			9	7			x	x			8	10		
	30. Water Polo			151	189			5	5			x	x			5	4
	Additional Activities																
	Field Hockey											x	x			8	10
	Natural Dancing ...											x	x			10	12

NOTE: Part I indicates school division placement and time allotment for the boy's program as presented in Chart III of the 1932 committee report. In Section II, the percentages indicate total time to be devoted to an activity in the three-year period (1 per cent being equal to approximately one week). Part II indicates changes for the girl's program as recommended by women raters. The percentages represent median scores from all ratings submitted.

ing, 10 per cent; Modified Games, 15 per cent; Playgroundball, 10 per cent; Volleyball, 8 per cent.

Junior High School, grades 7 to 9: Swimming and Diving, 10 per cent; Free Exercises, 5 per cent; Gymnastic Games and Relays, 7 per cent; Marching, 5 per cent; Tumbling and Pyramids, 6 per cent; Horseshoes, 3 per cent; Track and Field, 5 per cent; Gymnastic Dancing, 5 per cent; Clog Dancing, 5 per cent; Folk Dancing, 9 per cent; Modified Games, 10 per cent; Playgroundball, 8 per cent; Soccer, 6 per cent; and Volleyball, 10 per cent.

Senior High School, grades 10 to 12: Life Saving, 5 per cent; Fencing, 3 per cent; Heavy Apparatus, 5 per cent; Archery, 5 per cent; Golf, 5 per cent; Handball, 3 per cent; Squash, 10 per cent; Tennis, 10 per cent; Track and Field, 5 per cent; Clog Dancing, 5 per cent; Baseball, 5 per cent; Basketball, 10 per cent; Soccer, 5 per cent; Speedball, 5 per cent; Water Polo, 5 per cent; Field Hockey, 8 per cent; Natural Dancing, 10 per cent.

College Level, grades 13 to 16: Life Saving, 7 per cent; Fencing, 5 per cent; Heavy Apparatus, 3 per cent; Archery, 7 per cent; Golf, 10 per cent; Handball, 4 per cent; Squash, 5 per cent; Tennis, 10 per cent; Baseball, 5 per cent; Basketball, 8 per cent; Speedball, 5 per cent; Water Polo, 4 per cent; Field Hockey, 10 per cent; Natural Dancing 12 per cent.

In view of the opinion expressed by several of the women's society members, that such a study could well be carried on separately by the women's society, the Chairman feels it would be wise to recommend that such a procedure be followed. This recommendation will appear in Part IV of this report.

2. *Research Study of Activities Now in Common Use as Indicated in State and City Manuals.*—The following research project was carried on under the Chairman's direction by Mrs. Margaret C. Barr, a graduate student at the University of Southern California. The purpose was to determine to what extent activities now actually offered in schools throughout the country parallel the recommended activities proposed by the Curriculum Committee.

Unfortunately it was very difficult to secure copies of syllabi from states and cities. Many places were making complete revisions and did not have any of their active programs in print. The Chairman collected as many as were available by direct contact with state and city supervisors and additional ones were secured through local libraries. The total amounted to only twelve state manuals, eighteen city manuals, and one county manual.

It must be recognized, of course, that in many cases the manual is merely a proposed program, and that in actual practice, the activities offered may vary considerably. An additional point of difficulty was the fact that many of the minor games, stunts, self-testing activities, etc.,

appeared under varying headings in different manuals. It was necessary to make certain arbitrary groupings in order to establish a suitable classification. Time and space limitations prevent presenting a complete report on this research. Several different comparative groupings of activities were considered, only one of which will be presented in this report. The activities in the research were ranked according to the frequency of their appearance in the published manuals, the highest rank or greatest frequency being number 1. The rankings were by school divisions to correspond to the curriculum study. These rankings were then compared with the similar rankings as shown in Chart I, Section II, of the last year's Curriculum Research Report. The school manuals, of course, did not include the college level, hence the comparison is only for grades four to twelve inclusive. Table II shows this comparative ranking.

In studying Table II, it will be noted that in grades four to six, only nine activities received any degree of mention in the syllabi or manuals. The only difference between the manual ranking and the curriculum evaluation was that the manuals contained baseball while the curriculum does not. Two of the most highly ranked activities in the curriculum study (tumbling and pyramids and folk dancing) do not appear in the manuals.

In studying grades seven to nine in Table II, it will be noted that the first ten activities are the same with the exception that football and speedball appear later in the manual list. It will be noted also that the first fifteen activities are the same with one exception, namely, that tumbling does not appear in the curriculum list.

In grades ten to twelve in the senior high school a similar close relationship exists. The first ten activities are practically the same in both lists with the exception of speedball and touch football, which do not appear in the manuals. The first fifteen activities are the same except touch football, water polo, and life-saving, which do not appear in the manuals.

In general this shows quite a close correlation in general grouping of the most important activities in manuals as compared with the proposed evaluation of activities in the curriculum study. No attempt was made to compare the placement of activities in the manuals with the placement and time allotment in last year's study. Obviously it would be expected that some activities would be repeated through a number of school levels in the manuals.

This research study perhaps has no great significance, but it was an interesting one to show to what extent there was correlation between practice and theory.

III. REPORT OF SUBCOMMITTEE III—SELECTION AND ANALYSIS OF TEACHING SITUATIONS AND TECHNIQUE

Professor C. L. Brownell of Columbia Teachers College, representing Division III, submits the following brief report indicating progress on

TABLE II
COMPARATIVE RANKING OF ACTIVITIES IN SCHOOL MANUALS AND IN CURRICULUM EVALUATION

Grades 4–6 Elementary			Grades 7–9 Junior High			Grades 10–12 Senior High		
Activity	*School Manuals*	*Curric. Eval.*	*Activity*	*School Manuals*	*Curric. Eval.*	*Activity*	*School Manuals*	*Curric. Eval.*
Gym. Games	1	3	Track & Field	1	10	Basketball	1	3
Track & Field	2	7	Volleyball	2	6	Soccer	2	6
Mod. Games	3	4	Soccer	3	5	Tennis	3	4
Playground Ball ..	4	2	Playground Ball ..	4	4	Volleyball	4	8
Soccer	5	6	Gym. Games	5	12	Baseball	5	9
Tennis	6	10	Basketball	6	2	Football	6	2
Baseball	7	..	Mod. Games	7	11	Playground Ball ..	7	5
Swimming & Diving	8	1	Baseball	8	7	Swimming & Diving	8	1
Life Saving	9	5	Tennis	9	8	Wrestling	9	..
			Swimming & Diving	10	1	Track & Field	10	14
			Speedball	11	9	Boxing	11	12
			Football	12	3	Golf	12	..
			Touch Football ...	13	13	Handball	13	..
			Tumbling	14	..	Gym. Games	14	13
			Wrestling	15	15	Speedball	15	7

NOTE: The ranking indicated under the heading "school manuals" is in order of frequency of occurrence in the manuals studied, number 1 being the activity appearing most frequently. The items in the column heading "curriculum evaluation" represent the similar ranking received by each activity in the curriculum study as reported in Section II of Chart I in the 1932 Curriculum Report.

the part of his division. He suggests that he has drawn rather heavily upon suggestions contributed by members of one of his advanced classes during the past fall semester. This selected group consisted of experienced persons in the field of health and physical education, most of whom are candidates for the degree of Doctor of Philosophy. The general recommendation of this group deals primarily with formulating a working plan of procedure. It deals with two main divisions; *first*, some basic considerations affecting procedure, and *second*, proposed possible methods of procedure.

1. SOME BASIC CONSIDERATIONS

a) It is assumed that the selection and analysis of teaching situations and technique involves *first*, a careful study of existing conditions under which the various activities are being taught; *second*, an analysis of present methods being used to teach these activities; and *third*, proposals for improving the effectiveness of the physical education program through the specific contribution made by a better understanding of suitable teaching situations and an improved use of methods of instruction.

b) Activities of this subcommittee dealing with the selection and analysis of teaching situations and technique must, for the present, be tentative in scope until the reports have been accepted by the Society from Subcommittees I and II covering "Determination of Aims and Objectives" and "The Selection of Activities."

Moreover, any experimental research by the subcommittee under discussion should utilize the findings of Subcommittee IV concerned with the "Formulation of Standardized Tests of Achievement."

c) The problem assigned to this subcommittee is a difficult one. Most of the existing ideas relating to this topic reside in the minds of individuals who are faced with a given teaching situation and who experiment with various techniques until a seemingly satisfactory method is obtained. Exigencies of local conditions have led to wide variation in practice, and variety of practice precludes the crystallization of thought so essential if standards are to be evolved. One needs only to review the paucity of bibliographical or documentary materials dealing with the subject, to arrive at the above conclusion.

d) Due to tentativeness of the work of this subcommittee occasioned by dependence upon data obtained from other reports, it seems unwise to recommend that graduate students be encouraged to select M.A. or Ph.D. theses within this area. The subcommittee will evolve some other means of solving the problem.

2. POSSIBLE METHODS OF PROCEDURE

a) It is proposed that the personnel of this subcommittee be enlarged and that an outstanding leader in the field of each activity (such as swimming, boxing, basketball, etc.) be selected to conduct an investigation dealing with the selection and analysis of teaching situations and tech-

niques within that area. The work of the various specialists will then be coordinated into a subcommittee report containing: (1) general recommendations underlying or affecting all activities, and (2) specific recommendations concerning individual events.

b) Each chosen specialist will be provided with an outline of procedure and will be encouraged to submit a report of such nature that comparable data will be available for the various events insofar as this is practicable. As indicated above, specific suggestions will be treated in an appropriate manner.

3. TENTATIVE SUGGESTIONS

Suggestions as to general nature of proposed outline for specialists follow:

a) Illustrations of teaching situations to include teaching the activity as a part of the service program, teaching the activity as an intramural event, teaching the activity as an interscholastic event, combinations of the above, and other possibilities.

b) Suggestive characteristic elements of the teaching situation, including physical environment, the teacher, the student, facilities, the activity, student-teacher relationships, and techniques.

c) Illustrations of teaching techniques including demonstration, lecture, graphic or pictorial representation, squad or group teaching, combinations of the above, methods of introducing the subject, plan of practice period, and plan of measuring results.

d) Methods and techniques employed to produce in the learner desirable qualities with respect to habits, skills, attitude, and knowledge.

e) Data relating to teaching situations may be obtained from documentary sources, surveys of departments, consultations with experts, experimental techniques applied to methods, using either or both rotation and equivalent group type of experimentation.

f) Having obtained the necessary information the experts will analyze these data and propose recommendations gauged through assistant teachers in improving selection and analysis of teaching situations and techniques.

The proposed tentative outline above is subject to change and elaboration by the main committee.

IV. RECOMMENDATIONS

1. The Chairman wishes to recommend that the committee be continued as heretofore to carry on the further elaboration of the investigation following the general plan now under way; namely, of having the subject dealt with by extensive research studies sponsored by the various members of the committee.

2. It is further recommended that the present members of the Committee be continued with the exception of Professor C. H. McCloy of the State University of Iowa, who requests that he be relieved of responsi-

bilities in the Committee because of the heavy pressure of other work which makes it impossible for him to continue. The Chairman recommends that Dr. Frederick Cozens of the University of California at Los Angeles be appointed to succeed Dr. McCloy, as responsible for Division V on "Formulation of Standardized Achievement Tests."

3. It is further recommended that each of the present five divisions be formulated as subcommittees and that the representatives be authorized to serve as chairmen of the subcommittees, each to select additional members to serve as part of his subcommittee. Each subchairman should feel free to select as many committee members as he feels would add to the efficiency of the work.

4. It is recommended that the Society, through its secretary, request the National Association of Physical Education Directors for Women in Colleges and Universities to undertake a parallel study of the program for girls, in order that the ultimate findings may be made available for the entire physical education program covering both boys' and girls' work. Representative members of the women's association have intimated that they would be glad to undertake the study. The present men's Committee will be very glad to assist in any way or provide samplings of the procedures used up to date. It would be very desirable if the women would agree to carry on the study as a parallel, associated study in order that the ultimate findings could be jointly submitted.

Respectfully submitted,

W. R. LaPorte, *Chairman*
Frank L. Oktavec
C. L. Brownell
C. H. McCloy
Frank Lloyd

BOOK REVIEWS

THE HEALTH SCHOOL ON WHEELS. J. Mace Andress and I. H. Goldberger. (Ginn and Company, 1933) 399 pages. 80 cents.

Although written as a text in health for fifth and sixth grades, this book has been extremely interesting reading to at least one adult, the reviewer. Written in entertaining style, posessed of continuity, and authoritative in its scientific content, *The Health School on Wheels* will prove itself entertaining and instructive to fifth, sixth, and even seventh grades.

If the method suggested in this text be used by the teacher in her local situation, a thorough knowledge of community health and community health organization may be assured to the children. It is hoped by Doctors Andress and Goldberger that the trips described will actually be taken by pupils in their own communities. Of course, in many localities such trips will be impossible; to the children in these localities this text is especially significant. Its subject matter is stimulating to the student and it affords many helpful suggestions of pedagogical method and devices to the teacher of hygiene, social studies, civics, and community health. *The Health School on Wheels* is written in such lively style that it is bound to stir the child's imagination because the experiences of other children are described. "Next to having a real adventure, as everybody knows, we enjoy those that are told through word and pen. A story in which boys and girls participate has a reality that cannot be imparted to a formal text." This text is such a story.

Its many historical anecdotes will enhance its enjoyment and value to the reader.

"Although a book on positive hygiene rather than on disease, *The Health School on Wheels* does not dodge the problem of the prevention of disease, so vital to every community."

There is not the slightest hesitation by the reviewer in recommending and commending *The Health School on Wheels* as the finest text on community health for this particular age level that has appeared in the last few years.

Ross L. ALLEN
Health Education Teacher, Washington Junior High School, Rochester, New York.

CORRECTIVES IN RHYTHMIC DESIGN, BOOK THREE — GYMNASTICA. Perry-Mansfield. Music by Louis Horst. (J. Fischer & Bro., 1933) 12 pages. $1.50.

If one is interested in short gymnastic movements set to music and designed as more or less of a drill to last for thirty-eight minutes, this book should be of value. Divided into two sections the exercises are clearly defined as: I. "Exercises to reduce the hips and abdomen arranged in group form for any number of persons"; and II. "A group study for any number of couples preferably for mixed groups. The purpose is chiefly to increase strength and vitality in movement."

The exercises are varied and interesting in development, but in working with them the general feeling is one of choppiness, no exercise lasting for more than nine measures of music. The most valuable part of the book is the music for accompaniment by Louis Horst. In general the music which has been used by teachers of dancing for techniques has been either of the barber-shop chord type composed by accompanists, or snatches of the classics, cut and distorted to fit the situation. Mr. Horst has written not only good music but interesting music, and it is only to be deplored that he has not written more

in this particular book. It is most unsatisfactory to have units of excellent music of only four to nine measures.

The book of exercises may be a worthy contribution of the drill type. The music should be an inspiration to those who are interested in the part that music can and should play in dance technique.

HELEN N. SMITH,
University of Cincinnati.

SAFETY AND HEALTH OF THE SCHOOL CHILD. James F. Rogers, M.D. (Circular No. 65, Office of Education, Dept. of the Interior, 1933) 29 pages.

This circular is prepared as a self-survey of school conditions. It has been the aim of the author throughout to hold it to "essentials and economy." His premise in regard to the health teaching in the elementary school is that such teaching should be "opportune rather than importune." As for the secondary school level he feels that there should be a thorough grounding in biology, human physiology, and public health maintaining that as much care should be given to the teaching of these courses as to courses in academic subjects.

His self-survey is arranged in such manner that positive answers may be given and the questions are grouped under the following main headings: fire protection and escape, general housekeeping, air conditions, lighting, seating, water supply (drinking), water supply (washing), toilets, playgrounds, noon lunch, the school programs, instruction in hygiene, periodic examinations, daily observation, teaching personnel, and health of the teacher.

Under many of these questions there are concise statements which should act as a guide in answering them more intelligently. For example under "Water Supply" (washing) we find the following:

Is warm water for hand washing available?

In sufficient quantity?

It is not worth while to preach cleanliness if there are no facilities for its practice.

There are furthermore valuable references cited after each of the four following main divisions of the circular, "physical conditions of the school plant," "mental conditions of the school influencing health," "bodily conditions of the child affecting his life and health and that of others," and "teaching staff."

Anyone acquainted with Dr. Rogers' succinct method of expression cannot fail to recognize and appreciate his straight-forward approach to the subject of safety and health as it is dealt with in this short but valuable treatise.

V. S. BLANCHARD
Director, Health and Physical Education, Detroit Public Schools and Wayne University, Detroit, Michigan.

OUR CHILDREN—A HANDBOOK FOR PARENTS. Edited by Dorothy Canfield Fisher and Sidonie Matsner Gruenberg. Prepared and sponsored by the Child Study Association of America. (The Viking Press, 1932) 333 pages.

For over forty years the Child Study Association has dealt with parents who are interested in their children and therefore are desirous of obtaining answers to important questions concerning their development.

Thousands of questions have been asked and it was therefore possible to catalogue these under some such headings as teaching, diet, conduct, sex, play, discipline, and the like. With such a large number of questions, they could likewise be genetically considered from birth through adolescence as well as with due reference to their application to normal or to "problem" children. To reorganize these questions together with the opinions of experts detailed to answer them in a manner most helpful to parents has been the aim of this handbook for parents.

The task of answering the questions has fallen to twenty-nine experts in child training and guidance and parent education. The four main divisions of the volume are entitled: The Child's Growth and Development, The Child in the Home, The Child in the School, The

Child in the Outside World. At the beginning of each section are found typical parents' questions which serve as guides to thinking but have in no way limited the various contributors in their discussions. This method not only answers the questions but gives the reader a much broader background of knowledge and understanding.

This volume is a distinct contribution to the education of parents and teachers. It represents the best opinions of the present day concerning children. It forms the basis for a fine seminar or child study group and contains a splendid topical bibliography.

CHARLES C. COWELL,
The Ohio State University.

PHYSIOLOGY AND ANATOMY. Esther M. Greisheimer, B.S., M.A., Ph.D., M.D. and Raymond F. Blount, B.S., M.S., Ph.D. (J. B. Lippincott Co., 1933) Second Edition. $3.00.

The possession of this book by Greisheimer and Blount should be a source of delight and pride to every teacher of anatomy and physiology. It is the most outstanding book of its kind that I have had the privilege of examining. For many years there has been the need for a textbook which would fill the gap between high school and medical anatomy and physiology and this book does precisely that.

The book is organized on the assumption that no previous knowledge of anatomy is possessed by the student—knowledge which is essential to an understanding of the functioning of the human body. Each system of the intricate mechanism of the body is presented first by a consideration of its gross and minute anatomy, followed by a chapter on its physiology. Included in each chapter is also a section devoted to practical considerations, such as injuries, defects, diseases, and hygiene.

The material presented is clearly and simply written, the understanding of which is not dependent upon a host of details. For those teachers and students who desire a more complete knowledge of the subjects treated, details are included in fine print in each chapter. This is one of the most unusual features of the book and because of this the book may be used for both elementary and advanced courses.

The book contains some four hundred illustrations, more than half of which have been drawn especially for this text and the others are redrawn from more detailed and advanced books on anatomy and physiology, such as Piersol and Howell. There are also a number of reproductions of photographic plates which aid in understanding the relationship between the various bones and organs.

Special attention should be called to the "Teacher's Manual" which is to be found in the back of the teacher's edition of this text. This manual is an invaluable aid to the teacher. Each chapter is outlined, followed by a set of excellent questions and answers and some suggestions for laboratory work. There is also a complete glossary at the end of the book.

It is difficult to do this book justice in a short review because there are so many outstanding features about it that should be mentioned. I enthusiastically recommend the book to the teacher for her personal use and as a text for her students.

BERTHA DESENBERG
Director of Physical Education and Instructor in Physiology and Hygiene, Greenbrier College, Lewisburg, West Virginia.

HEALTH MISCONCEPTIONS OF PROSPECTIVE TEACHERS. Paul Rhoton, School of Education, Pennsylvania State College, State College, Pa. (Doctor's thesis) 80 pages. $1.00.

Everyone who has worked with teachers, everyone who has observed health lessons must have wondered at least once where some teachers got their stores of queer ideas. While there have been compilations of superstitions from various parts of the country, Mr. Rhoton has been the first to study health misconceptions of prospective teachers. This book is of value particularly to those who teach in normal schools, teachers' col-

leges, etc., and to those who supervise health teaching.

There are eight chapters, appendices, and a bibliography in this book. Detailed information as to the construction, distribution, and scoring of the tests used is given. A complete analysis of the findings is so given that it is possible to compare the responses of various types of students—students in state teachers' colleges, liberal arts colleges, health and physical education majors, and negro colleges. The data are presented in tabular and graphic form. The influence of habitat on health information is included. The appendices contain the letters that accompanied the tests as well as an excellent bibliography.

Some of the significant findings are:

1. Formal education has failed in a marked degree to remove health misconceptions from the beliefs of the individuals studied.

2. Women students show on the average, less belief in the misconceptions presented than do men.

3. Subjects completing courses in health and physical education give evidence of higher aggregate of health than do other students. This superiority is probably due to a greater knowledge of matters involving exercise games and play than to any superiority of knowledge of all phases of health.

4. The great majority of subjects recognized the more traditional type of health superstitions presented.

5. There is evidence that commercial advertising is productive of numerous unscientific health beliefs among the better educated class of individuals represented by the subjects participating in this study.

6. No variations were evident that might be ascribed to geographic location.

This study is interesting; similar studies should be made from time to time to indicate progress. The book forms an interesting basis for a teacher to check the needs and progress of her particular group.

MARY MAY WYMAN
Supervisor, Health and Safety Education, Louisville Public Schools, Louisville, Kentucky.

A TEXT BOOK OF PHYSIOLOGY. William H. Howell. (W. B. Saunders Company, 1933) Twelfth edition. 1132 pages. $6.50.

The latest edition of this standard text follows very closely the content organization, and method of presentation of earlier editions with such revisions of subject matter as are indicated by results of recent experimental investigations. The nine sections comprising the body of the book are devoted to discussion of the several functional systems of the body. Brief discussions of the structure and classification of the proteins and of the phenomena of diffusion and osmosis are included in the appendix. A few references to the literature, particularly to review articles and to certain outstanding papers, are inserted.

The extent and significance of recent contributions of fact and theory particularly to the subjects of the vitamins, internal secretion, and the chemistry of muscular contraction are reflected in the present revision. The recent developments in the theory of muscular contraction are probably of greater interest and importance in their more theoretical aspects for physiologists than in practical applications for physical educators. Those who have followed the details of the experimental work underlying the present "revolution in muscle physiology" can well appreciate the clarity and essential accuracy of Howell's discussion, at the same time regretting the necessary violence of textbook treatment to the dramatic quality of the discoveries.

Since the purpose of the book is to serve as an introduction to the whole field of human physiology, the treatment of each subject may, quite necessarily, appear rather inadequate to the specialist, whether he be physiologist or physician. The author himself is apparently fully aware of these limitations. He does, however, attempt throughout the text not only to give the student a digest of the facts and theories most acceptable at the present time, but also to develop an appreciation of the gradual evolution of these beliefs and of the provisional character of all physiological knowledge.

The discrimination, simplicity, and clarity with which Mr. Howell presents the vast and complex body of physiological fact and theory truly justifies the extensive, almost classic, use of his book as an elementary text for students whose background includes some training in chemistry, physics, and anatomy.

PAULINE HODGSON
Assistant Professor of Physical Education for Women, University of California, Berkeley.

NORMAL AND ELEMENTARY PHYSICAL DIAGNOSIS. Whitelaw Reid Morrison and Lawrence B. Chenoweth. (Lea and Febiger, 1932) Second Edition. 376 pages. 3 plates and 138 engravings. $4.00.

The purpose of the book is primarily to meet a need for a suitable textbook in normal and physical diagnosis for students and teachers of physical education. The book will also serve other teachers particularly home-room teachers, and should be most useful to physicians and nurses responsible for school health examinations.

The first three chapters deal with the various intrinsic factors in the administration of the health examination; general consideration; pre-examination procedures such as instruments, equipment, history and examination; methods of examination, order, recording findings, examination record forms, and the examination of athletes.

Chapter IV features what can be ascertained about an individual from his general appearance, and discusses also height and weight and various scales for interpreting them.

The next fifteen chapters (V through XIX inclusive) discuss in helpful detail the etiology and diagnosis of the various common deviations from the normal which are classified under the following major chapter headings; nutrition, muscular system, posture, feet, skin, glands, bones and joints, eyes, ears, nose, mouth and throat, thorax and lungs, heart and blood vessels, abdomen, genito-urinary system, and nervous system.

Chapter XX should be particularly valuable to nurses and to all teachers as it deals with important symptoms and their probable causes, signs of health disorders and physical defects and the common diseases.

The concluding chapter introduces, classifies, and discusses in some detail anthropometric tests, physical capacity tests, and health and physical fitness tests.

The functional aspects of diagnosis are stressed throughout the book and treatment is mentioned only in the case of the most common conditions. The authors make clear in the preface that it is the place of the medical men to diagnose and treat and that it is the educator's opportunity and responsibility to note deviations from the normal and report them to the proper medical authorities. It is felt that the stated purpose of the book is most admirably fulfilled.

HARLAN G. METCALF
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THE ELEMENTS OF CANOEING. Albert Van Siclen Pulling. (Ann Arbor Press, 1933) 139 pages. $2.00.

If there is any field of sport in which the literature on technique and teaching methods has been meager and on the whole unsatisfactory, it is canoeing. Albert Van Siclen Pulling has met this need in admirable fashion in this practical, concise little manual.

Mr. Pulling is a forester by profession, but by experience he is a woodsman and guide. If one holds any doubt as to this point he has but to finger through the manual to be convinced. The pages are filled with a wisdom born of years of experience in the Canadian bush on lake, river, rapids, and portage. Dismissing formal paddling with a brief description, Mr. Pulling relies on practical paddling, and champions the type of technique used by the trappers, guides, and Indians.

The author wastes no words. In clear, concise, vivid terms, he describes the various fundamental movements. The

J-stroke or Canadian chop as the most essential stroke, and the other necessary strokes are clearly described with a view to the order in which they should be taught, and the methodology needed in teaching. In addition to lake technique, river work, "white water" paddling, poling, and portaging are described. War canoeing and canoe sailing are treated.

The chapter on safety abounds with common sense that every counselor and teacher of canoeing should know. Excellent standards, tests, and classifications are presented.

As a text for schools, colleges, and camps, and as an effort to standardize a sport that has been neglected in literature, the book is a significant and a worth-while contribution by an author whose qualifications are unquestioned.

BERNARD S. MASON
Camp Fairwood, Bellaire, Michigan.

A REPORT OF PROGRESS IN CORRECTIVE AND DEVELOPMENTAL PHYSICAL EDUCATION IN THE QUINCY SENIOR HIGH SCHOOL. Helen B. Kitchen, James Lecain, William H. Whiting, Maria E. Drew, M.D., Frederick Rand Rogers. (The Pleiades Co., 1933). 25 pages. 25 cents.

The Quincy Senior High School instituted a new program of physical education for those of the pupils who were in need of remediable or corrective work. This program was begun in May, 1932, and included those pupils who had postural defects, flat feet, or a Physical Fitness Index of below eighty-five. (The Physical Fitness Index is a test devised by Frederick Rand Rogers which is made up from the individual's age, weight, strength, and lung capacity.) Special work was given to these pupils to aid in the correction of each individual's particular need.

In January, 1933, these pupils were checked for improvement and results of their new program. The medical examinations were rather indefinite but reported with general statements such as "improved condition," "general attitude good," "posture improvement especially noticeable." The Physical Fitness Index records indicated a very great improvement, with an average increase of 21 points or 26.6 per cent for the boys, and an increase of 13.4 points or 19 per cent for the girls. The improvement in the foot conditions seemed very great, with the boys having an increase in the arch angle of about 39 per cent and the girls 21 per cent.

In interpreting these improvements a comparison is made with records obtained at Montclair, New Jersey, where the P.F.I. tests were given in 1924 and 1925. The Montclair pupils, who did not have special work, went from a score of 105.7 in 1924 backwards to 104.1 in 1925, thereby indicating a loss in general vitality, whereas the Quincy pupils improved 26 per cent.

The pupils who took this work and improved under it, report that they feel better; that they "feel like doing things." The teachers of physical education, who were skeptical at first, now feel that the new program has "revolutionized" the attitudes of many pupils toward their physical education work. The Supervisor of Physical Education reports that "the entire Department was lifted"; that "the improvement in social efficiency was remarkable."

This report gives a brief explanation of the work done for these pupils who needed individual attention. The program given for individual aid seems indefinite but possibly it was not. There is no statement of the kind of work that was given to improve the flat feet, to correct the poor postures, or to increase the lung capacity or strengths of any weak muscle groups. The comparison made with the Montclair school P.F.I. leaves one with a temptation to ask the question, as to what kind of a physical education program they could have had that would have permitted their pupils to lose strength and lung capacity during the year.

The report shows that a definite something is being aimed at; that a program is being used; that tests are

going to show the improvements that are made; that those things not of value will be discarded; that individual conferences and individual work will be a definite aim of this program.

REXFORD C. QUIMBY, Ph.D.
Professor of Physical Education, Berea College, Berea, Ky.

THE MODERN DANCE. John Martin. (A. S. Barnes & Co., 1933) 123 pages. $1.50.

It is particularly interesting to find a professed connoisseur of the dance stepping forth to his own defense, interpreting his deductions on outstanding practice, and expounding his underlying theories. In *The Modern Dance* John Martin, the Dance Editor of the New York *Times*, explains in some detail his conceptions of certain common principles and purposes of contemporary dance art. Mr. Martin's point of view is significant because in these days the profession of dance critic is still most unique. Newspaper accounts of dance performances are written, often under protest, by an unwilling and unequipped dramatic or music editor because no one else will undertake the assignment.

From a serious point of view there is much of value in the book. Modern dance, as distinguished from romantic and classic dance, is analyzed carefully from the several standpoints of movement, form, and technique. The relation of dance to music and other art forms is thoughtfully studied. The psychology of dance creation, production, and reception is treated in detail.

Mr. Martin's style is far different from that of the hide-bound pedagogue. He allows himself utter freedom of expression by stating openly, "The right is reserved to repudiate any or all of the grandiose definitions about to be given, the day after tomorrow." Thus he insures his personal protection against criticism of his sincere philosophical conclusions, as well as his tongue-in-cheek type of allusions. With a grand gesture organized education is defined as "a pseudo-scientific patter which is taught in the schools—a rational conversation on almost any topic dealing with the action of nature."

It is highly amusing to find such expressions as "the ethereal chiffon-waving exhibitions by our poetic sisters of the scarf and garland school of dancing," and "a barefoot lady in gauze draperies adds nothing to the poetic conception of a waterfall." The author criticizes a member of our profession by saying that she "avoids the necessity of a definition in a masterly fashion." In many instances Mr. Martin shows the same masterliness, but it is obvious that he thoroughly enjoyed the evasions!

The teacher of physical education who expects to find material or practical methodology will be disappointed, as the approach is almost entirely from the standpoint of the stage and art development. The teacher of physical education who thinks beyond class routine and is interested in the larger development of the profession will find many interesting ideas and suggestions. One of the chief values of the treatise is its thought-provoking characteristics. One might agree with part of the material, disagree violently with another part, and be delighted with certain original deductions. It is without doubt an interesting book to read.

HELEN NORMAN SMITH
University of Cincinnati

PEACE OF MIND AND BODY. William S. Walsh, M.D. (E. P. Dutton and Co., 1933) 243 pages. $2.50.

This recent addition to other popular companion volumes of Dr. Walsh is a timely one. His former volumes dealing with personality, the inferiority feeling, and fear were well received by laymen. The present work should be no exception.

At all times reason and understanding have been potent factors in the control of one's integration. We tend to fear when we fail to understand. Today, as never before, individuals need scientific information so presented that it will be readily understood. Not only is this true

about blood pressure and love life but about present day economics as well. When scientific reason takes command, disintegrating emotions are dissipated.

Although Dr. Walsh does not stress modern education's great responsibility in building a personality rather than a mere learning machine, this is implied throughout the book. He begins with a discussion of our strenuous modern life and how it violates biological laws. He stresses the oneness of mind and body and the importance of the simple life with some common sense advice concerning personal hygiene. The necessity for reorganization of our mental lives and the elimination of faulty thinking is given an important chapter. Other chapters dealing with one's vocational adjustment, leisure, fatigue, blood pressure, social adjustment, "keeping up with the Joneses," and the place of love in life complete a picture which endeavors to help the layman see himself as others see him. The final summarizing chapters deal with equability and tranquility.

This volume is an important contribution to mental hygiene for the layman and therefore a great boon to parent education. It likewise has a ringing message for the average teacher whose education does not yet always leave him or her with either a biological understanding of the teaching self or the child to be taught. When these two things are fully accomplished, education and therefore life will be happier and richer in content and sound philosophy.

CHARLES C. COWELL,
The Ohio State University.

THE VISUAL FATIGUE OF MOTION PICTURES. Aaron E. Singer, Research Editor. (Amusement Age Publishing Co., 1933) 48 pages. $1.00.

Mr. Singer compiled this research monograph after a careful world-wide survey on all literature covering the subject of visual fatigue of motion pictures. The visual strain endured by millions of motion picture patrons daily throughout the world may never be computed but the progress of the motion picture industry, due to its own initiative and research from without, shows an irrevocable stride toward the eventual, it is hoped, elimination of the factors responsible for it. The effects on the retina of motions of various sorts have occupied the attention of psychologists, physiologists and finally those engaged in a new branch of science known as physiological optics.

Under the section of Current Research Reports Condensed, the author covers such subjects as: Lighting, The Eye, Projection, Education, Ventilation, Exhibitor, Architecture, Seating and Posture, and Screen. The researches are condensed from those of various companies and universities. A few of the brief conclusions under each heading were found as follows:

Lighting.—In general, fatigue of the eye is less important than fatigue, nervous tension, etc., in the human being as a whole.

The Eye.—Sharp contrasts between the object of direct regard and objects in the indirect field of view lead to fatigue. Orchestra lights, exit lights, and other bright points of illumination in an otherwise dark room lead to fatigue, just as a relatively brilliant picture in an otherwise dark room leads to fatigue.

Projection.—Double-feature programs are definitely bad, fatigue decreases with the increased picture rate, colored light induces fatigue, and experience has shown that the first row of the balcony is by far the best location in the house.

Education.—"Daylight Projection" or anything approaching it should be discouraged.

Ventilation.—With air conditioning prevailing in the theatre, the so-called "movie-headache" is becoming a thing of the past.

Exhibitor.—All available methods have been taken in the Radio City theatres to avoid the difficulties resulting from light contrasts, whether simple or successive.

Architecture.—The center of interest, the "big smash" of the movie theatre,

is the screen, and all interior design of the house should concentrate upon it.

Seating—Posture.—Posture and discomforts arising from the seating do far more to destroy the effectiveness of the entertainment than do sleepiness and eyestrain.

Screen.—Screens should have neither form, edge, nor border; the screen of the future may be vapor charged by steam backstage possessing an apparent depth and a sense of the infinite.

The last section of the booklet deals with a most comprehensive survey of literature and research conclusions beginning with the year 1908 to 1933. These dated researches are compiled from all parts of the world. Mr. Singer has compiled and edited a fine piece of work and it should be read by all in physical education who are interested in the study of fatigue.

"Eyes are better, on the whole, than telescopes or microscopes."—EMERSON

FRANKLIN B. HOAR,
Taylor Allerdice High School, Pittsburgh, Pa.

BASKET PIONEERING. Osma Palmer Couch. (Orange Judd Publishing Company, 1933) 172 pages. $1.25.

The title of this book is happily chosen. It is more than a book in basket making—it is a book in basket *pioneering*. Departing from the beaten trail of basketry which relies upon commercialized materials, this book takes us into the woods, fields, and swamps and shows us basket materials in a surprising array of variety and abundance, materials which are ours for the taking and cost us nothing.

This book breathes the spirit of craftsmanship, it breathes the creative spirit, and what is still more interesting, it breathes the spirit of the woods and open spaces. It is a book of woodcraft.

Basket Pioneering is invaluable to the camp-craft and arts-craft counselor in organized camps, to craft teachers in schools, and to all who are interested in craftsmanship with woodsy materials. Wherever such a person might find himself in this broad land, he need not want for local wild materials in abundance for basket making—grasses, vines, runners, shoots, leaves, pine needles, roots, barks, splints, and corn husks.

The best craft program in summer camps is one which relies on the native wild materials which the particular locality offers. Mrs. Couch guides us to these materials, and her book will make the craft program of many a camp more varied, interesting, and educationally sound.

Step by step we are led by clear descriptions and vivid, simple diagrams through the various standard stitches and others that are not so well known. Even the uninitiated could not fail to master the various processes of making bases, handles, covers, and borders, both plain and in design. The styles of the baskets are many, and often original, and there is a challenging section on basketry novelties. Although all types of basketry are covered, frequent reference is made to the technique of the American Indians.

The introduction is by Daniel Carter Beard.

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SEX EDUCATION SERIES: (1) The Story of Life, (2) In Training, (3) How Life Goes On and On, (4) The Age of Romance, (5) The Venereal Diseases. Thurman B. Rice, M.D. (American Medical Association, 1933) 25 cents. $1.00 per set.

For years, educators, students, and all others interested in social welfare have been looking for concise statements of facts concerning sex which would be appropriate for various age groups, simple enough for children, youths, and adults of average intelligence to understand, free from hereditary taboos, couched in well-chosen terms. Many pamphlets have been published with the best of intentions that have failed because they were too technical, too didactic, too advanced, too intimate, too emphatic in view from a religious or medical standpoint.

In the pamphlets listed above, we have the latest, and by far the best series published to date, a series which satisfies the objectives first stated, and which at the same time avoids the errors, mistakes and pitfalls indicated in the foregoing paragraph.

Every child of ten should read the first pamphlet; all of them should be read by every high school student, boy or girl, every teacher, every parent, every young man and woman. It would be especially desirable for every social worker, every clergyman, every physician, to read them all and ponder them well.

What encouragement and inspiration to have such splendid educational tools in our hands!

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Dance as an Art Form. La Meri (A. S. Barnes and Co., 1933) 190 pages. $1.50.

Dance, more than any other art, has suffered from a lack of recognition and understanding on the part of the layman. This can be attributed to the fact that not only are concert dance performances unavailable for the great majority but also because experts and critics have offered little in the way of noteworthy interpretation. La Meri has attempted to do this very thing in supplying in her own words " . . . a concise view of the basic principles upon which rests the technique and spirit of the different types of dancing now being presented by serious artists for aesthetic judgment." As such, her book is welcome. That she has failed to present a clear or comprehensive picture of that form of the art which most concerns us at the present time—modern dance—is unfortunate. Certainly, however, one finds here a most adequate treatment of the ballet, and a detailed and extensive review of the ethnologic dance, which should provide valuable reference material in this field.

The author defends in forceful fashion the latter sphere of dance activity, and condemns those whose appreciation does not extend to its representation by dance artists. Her arguments are for the most part unassailable. However, dance being the personal art that it is, partaking intensely in its folk forms of the mores and customs of the group from which it springs, is apt to be less universal in its appeal than is music, for instance, and therefore responds less readily to re-creation and interpretation by alien artists. Nevertheless, she is quite correct in asserting that if this field of the dance is to preserve its pure traditional forms, it will undoubtedly be through the efforts of dance artists who dedicate themselves to the necessary research and industry. Its sociological significance, so important in these days of international misunderstanding and suspicion, is stressed in commendable fashion. The teacher of folk dance will be able to find here many items of value to add to the meager store of background material available at present.

It is in the realm of the Free Dance that the author displays an amazing conception of principles and aesthetic purpose. Indeed, one cannot help but suspect that at times she writes in its defense with tongue in cheek. Witness the following quotation: "It is the soul that speaks in the Free Dance, not the body." " . . . and yet definite enough for the free dancer, for free dancing cannot be taught, it can only be inspired." Her major error may be due to the fact that she has chosen to group all dancing and dancers from Isadora Duncan to Martha Graham in the same "Free" category, and to interpret all their art as "soul inspired." Much of what she says is true of those representatives of the Romantic period who found in dance opportunity for an undisciplined display of pseudo emotionalism. Any art, freed from the shackles of traditional forms, may become so entranced with its new liberty that all governing principles, worthy or unworthy, are set aside. The author must be speaking of such misguided expression when she says in one place, "Free danc-

ing must, first of all, have an idea—thought is a rein that he (the dancer) cannot let go of for an instant"; and in yet another, "Some day the mystified public will develop an understanding and will be able to rely on its intuition to discover the cause and effect of a dance. . . . " Any art form which starts so definitely with an idea and succeeds only in mystifying in its portrayal surely deserves the appellation of "surprise package"!

To explain modern dance in these terms is to take no account of its repudiation of these false standards of artistry. That it is still in an exploratory stage is not to be denied, but it has withdrawn its head from the clouds and its feet are on the ground. If we fail to understand its meaning and significance, it may be due to artistic insensitivity, or certain undesirable ideas gained from past experiences. Hardly, however, can it be because our intuitive insight is too deficient to encompass the expressive whims of a wide variety of individual emotions!

If one can overlook the misconception of important contemporary trends in dance, there is much in this book to justify its use. Besides the material already mentioned, this would include a table of dances and a glossary of terms available in the final pages.

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THE ACH INDEX OF NUTRITIONAL STATUS. Raymond Franzen and George Palmer. (The American Child Health Association, 1934) 12 pages.

This pamphlet is a very welcome addition to the field of testing in health and physical education. Early in the last decade the American Child Health Association started its preparation for The School Health Study from which *The ACH Index of Nutritional Status* was derived. This Index formulated from several thousands of measurements of ten thousand children between the ages of seven and twelve years is devised to select the most serious defects of "malnutrition" or "undernourishment" for further and more thorough examination by the physician. By taking two measurements of the girth of the upper arm, two measurements of the depth of the chest, and one measurement of the width of the hips, this index is calculated. A simple addition and subtraction with a reference to a brief table completes the determination of the index. By such a calculation approximately 10 per cent of the children will be chosen.

The ACH Index is the practical suggestion of the American Child Health Association to replace the height-weight-age tables which the Association proved conclusively in its School Health Study to be a very poor measure of nutritional status. It is hoped that the ACH Index will be accepted as a more valid measure of nutritional status; it is not intended, however, to replace the thorough medical examination. The Index is merely a screening device; it has little diagnostic value without the support of the opinion of a physician.

This booklet relates the development of the ACH Index; it includes a description of the technique for its use and suggestions for its possible uses; it also suggests a record blank for the recording of the anthropometric measurements. It is quite probable that the ACH Index of Nutritional Status will have as wide use within the next few years as the height-weight-age tables have had.

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EDUCATION IN DENMARK, the Intellectual Basis of a Democratic Commonwealth. Edited by Andreas Boje, Ernst J. Borup, Holger Rutzebeck. (Oxford University Press.)

This volume will commend itself to all students of contemporary education.

It consists of a delightful compilation of essays, rich in historic data, written by numerous educators and teachers in Denmark. The purpose of the volume, apparently, is to set forth a picture of Danish education in terms of Danish life and ideals. The customs and history of the Danish people are briefly presented with an illuminating appreciation for a pragmatic democracy.

The volume is divided into half a dozen sections which cover the following major topics:

1. Elementary and Secondary Schools
2. Adult Schools
3. Child Welfare
4. Associations for Young People
5. Libraries and Broadcasting
6. Associations for Adult Education

Appendix. The State and the Schools.

Under the first topic the history of the Danish school is presented showing its lines of development and its provision for the education of children in the *free folk schools*. This section is ably written by Holger Rutzebeck, Vice-Director of School Administration, Frederiksberg; C. J. Alvin, Principal of La Cour Vejen's School, Copenhagen; and Ernst J. Borup, Principal of Grundtvig's Folk-High School at Lyngby. The memorable names of Christian Kold and N. F. S. Grundvig, pioneer founders of Danish education, are mentioned again and again, with zealous commendation for their labors.

Adult schools, in the second general topic, present the opportunities for culture, physical development, domestic and horticultural activities among adolescents and adults. A strong essay on "Day and Evening Continuation Schools" is set forth by Jorgen Banke. Supplemental to this discussion is an important description of the folk-high schools, schools for domestic economy, schools for professional learning, and schools for technical and commercial training.

The third division of essays considers child welfare. Andreas Boje introduces the section with a discussion of neglected, difficult, and problem children. Historical steps in the development of governmental machinery, allied ecclesiastical and philanthropic organized agencies, are set forth. Possibilities are indicated for aiding the advance of education as a means for coping with the problem of delinquent and unfortunate children. Child welfare is apparently focal in the minds of Danish educators and every functioning agency seems to find time and energy for this worthy social expression.

Novel as it may appear, this volume gives space to libraries and radio broadcasting. Libraries, in Denmark, are traced from the time of eighteenth century rationalism. Libraries declined during the nineteenth century and revived in the twentieth century with renewed emphasis. Broadcasting is made an ally of education. It is controlled by a board responsible to the national Ministry of Public Works and in part to the Ministry of Education and contiguous journalistic agencies. In proportion to the population Denmark claims to have more radio listeners than any other country. Their radio programs are less commercialized, being financed on income derived from license fees which guarantee more serviceable and cultural entertainment and enlightenment. News, plays, and lectures are said to be in greater evidence than in other countries. The value of radio in education, it must be said, is not an attempt to substitute for the teacher but rather exists as a stimulus to learning in the schools.

Associations for young people, and associations for adult education are essayed at considerable length. These associations represent activity in the Workers Educational Movement which functions educationally rather than politically. This movement is the center for labor organizations. It is supported by annual subscriptions and voluntary contributions. The associations plan lectures and seek to develop the social, economic, and historical knowledge of the working people. They cultivate the useful cultures such as

drama, music, art, and debate augmented by the activities of popular university extension programs. The state gives partial financial aid. Folk-high schools for working men offering a three-year course of study have been developed in some centers. More common, however, and more popular is the Study Circle Movement which is very successful in cities. These circles offer abundant opportunity for reading and cultural development through social studies and Danish folk-lore.

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YOUTH AND HIS COLLEGE CAREER, J. E. Seyfried. (University of New Mexico Press, 1933), xii, 251 pages. $2.25.

Professor J. E. Seyfried's *Youth and His College Career* is a book of real value to the college teacher of freshmen, to the high school principal preparing boys and girls for college, and to the student before he goes to college and after he has entered. It is most timely and discusses the problems in a very logical manner. To any of these several groups I recommend the book cordially.

The book is comprehensive in scope. It contains three main sections, one dealing with the problems faced before the selection of a college is made, another with those questions which arise in the process of adjustment to college life, and finally, the ways in which a college education can be put to use to bring the surest returns in personal satisfaction, material success, and a generally fuller and better life.

I feel that the book is a valuable contribution to the whole guidance program which should be worked out by the secondary schools. In too many instances the individual going to college has not counted the cost in either effort or money with the result that we have too many students dropping out or failing in their college career.

It is remarkable not for its exhaustive discussion of the problems with which it deals, but for the excellent selection which was made from a great mass of available material, which omits the too detailed, the technical, and the inessential, leaving the portions that are of practical use to a wide range of individuals.

A feature of unusual value to the faculty member studying the subject is the bibliography. Its extensiveness indicates the amount of work and the breadth of viewpoint with which the work was approached and adds weight to the conclusions and advice which, if followed by the high school or college student, would add much in real experience to their lives. Perhaps in no other place is to be found so complete a listing of the books and articles to be consulted.

At the moment I can recall no other book covering so wide a field in so satisfactory manner. I believe Professor Seyfried has done an outstanding piece of work for the youth of our land.

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